

MANAGING DROUGHT

IN THE SOUTHERN PLAINS

March 8, 2012

Webinar Format

- 2nd and 4th Thursdays of each month at 11:00 a.m. Central Time
 - 4th Thursday will be a drought status update & outlook only (no focus topic)
- Overview of regional drought conditions and outlook for next several weeks to months
 - led by the Drought Monitor authors
- Discussion Topic
 - Alternating between an impact type (wildfire, agriculture) and a resource (monitoring tools, assistance programs)
- Comments & Updates from State Climatologists
- Open-ended time for questions and comments
- Total Time Commitment: 45 minutes for presentations, as much time as needed for discussion
- Past webinars, summaries, and Federal/State Assistance links posted on the U.S. Drought Monitor, <http://www.drought.gov> in the Southern Plains Region. Webinars posted on Youtube: <http://www.youtube.com/user/SCIPP01>

Regional Drought Monitor Update

Brian Fuchs, Climatologist

**National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln**

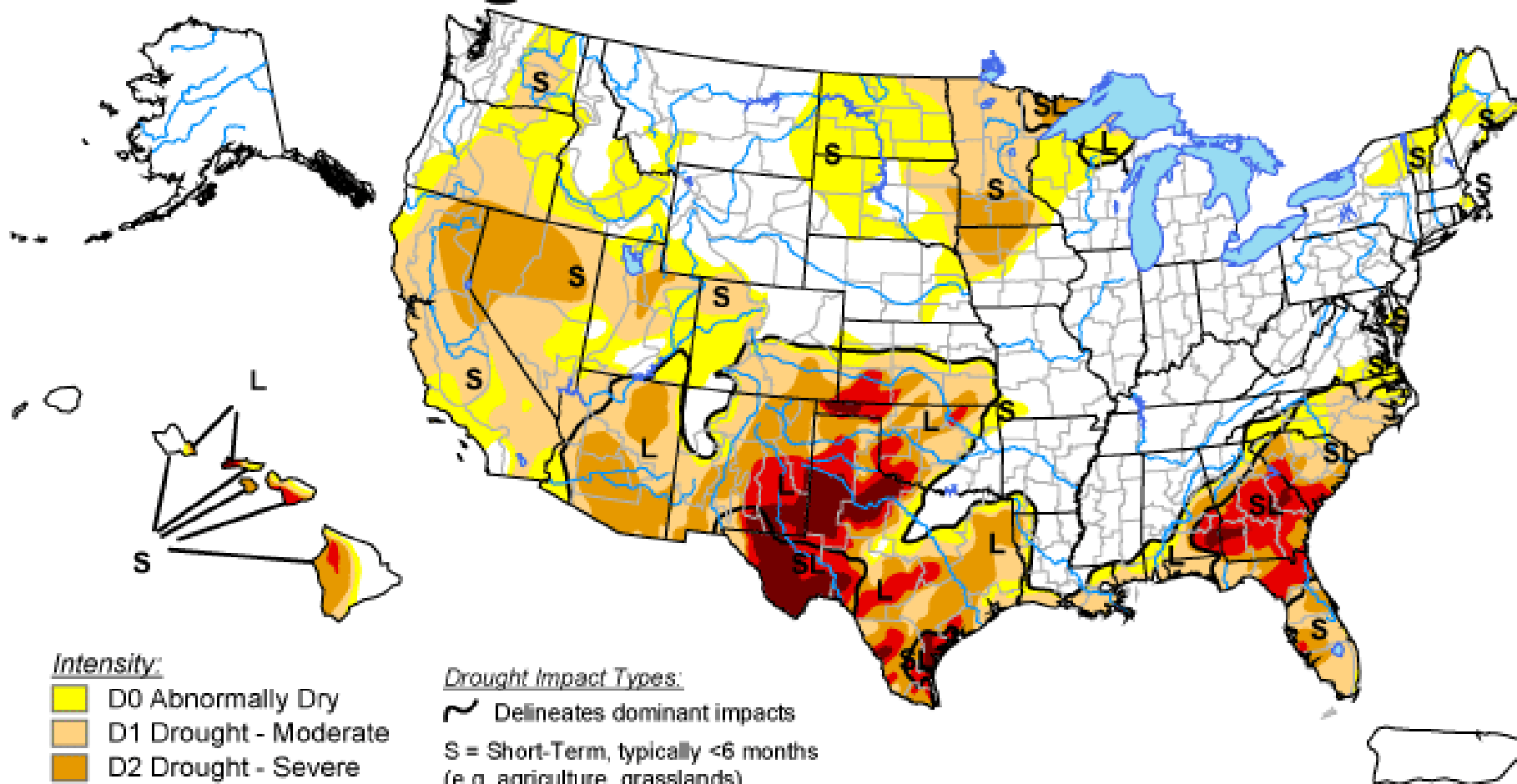


SCIPP/NIDIS Drought Webinar Series, March 8, 2012

U.S. Drought Monitor

March 6, 2012

Valid 7 a.m. EST



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.



Released Thursday, March 8, 2012

Author: Michael Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

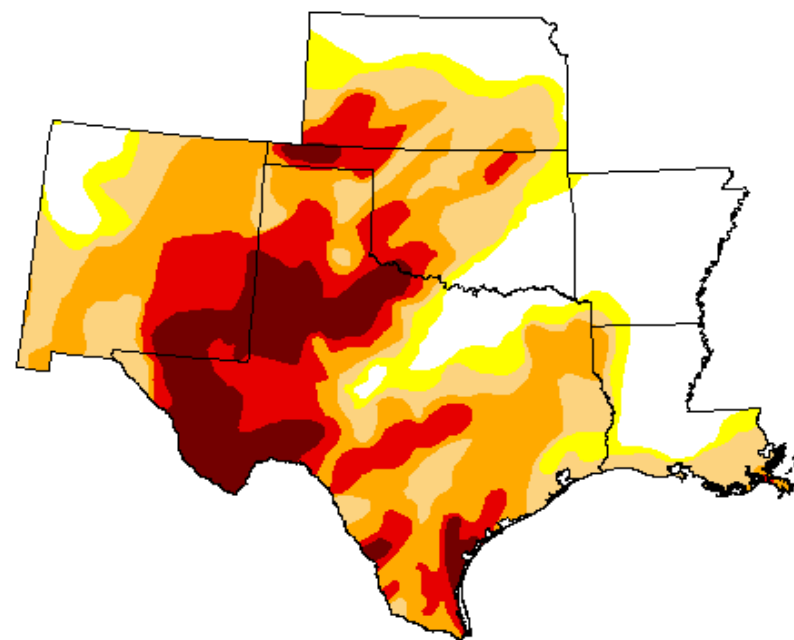
March 6, 2012

Valid 7 a.m. EST

South Central United States

Drought Conditions (Percent Area)

	None	D0 - D4	D1 - D4	D2 - D4	D3 - D4	D4
Current	23.50	76.50	67.44	48.00	25.51	10.74
Last Week (2/28/2012)	24.14	75.86	66.60	47.54	25.00	8.11
3 Months Ago (12/6/2011)	13.61	86.39	80.65	67.30	50.74	24.53
1 Year Ago (3/1/2011)	6.19	93.81	68.57	36.72	8.85	0.00



Intensity:

D0 - Abnormally Dry	D3 - Drought Extreme
D1 - Drought Moderate	D4 - Drought Exceptional
D2 - Drought Severe	

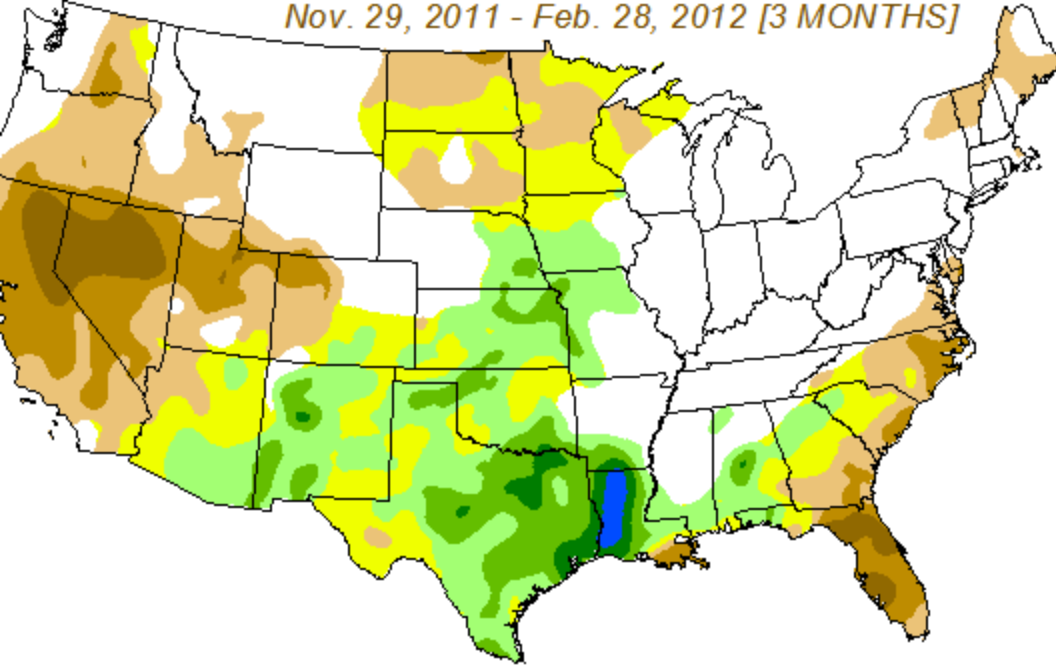
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<http://droughtmonitor.unl.edu>



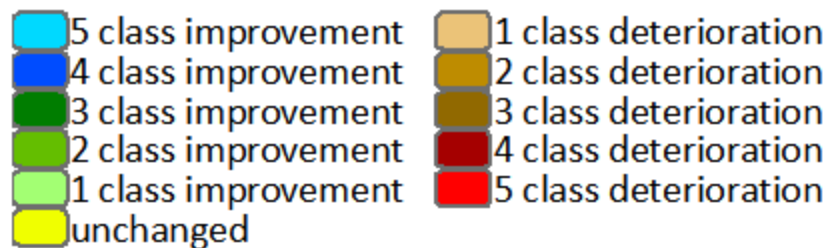
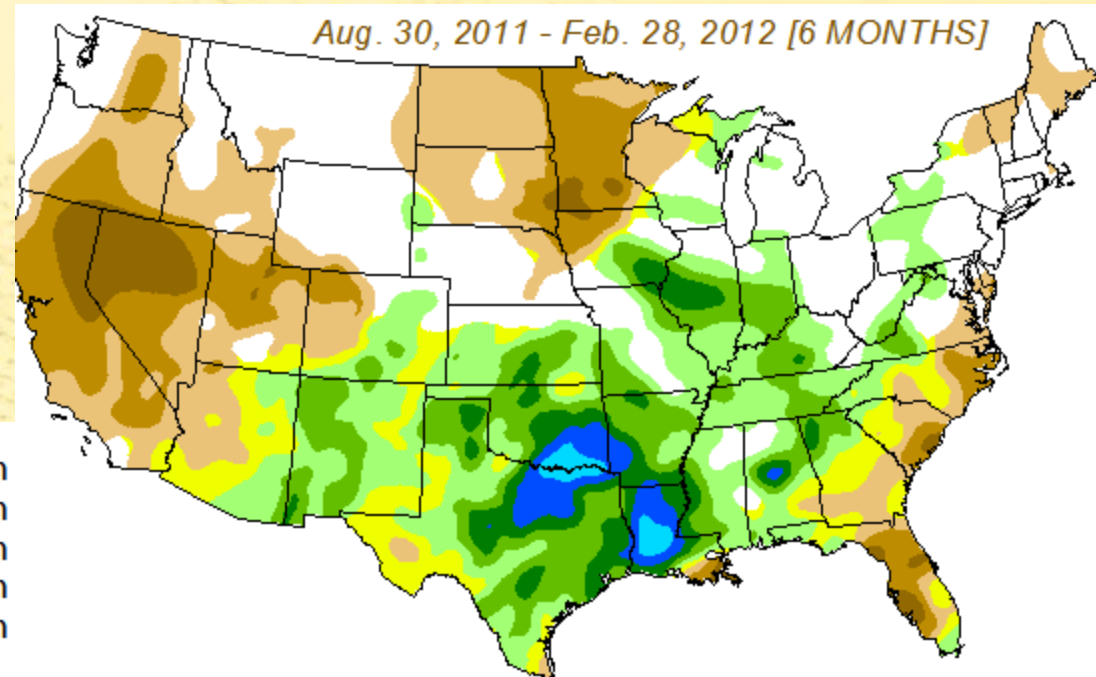
Released Thursday, March 8, 2012
Michael Brewer, National Climatic Data Center, NOAA

Nov. 29, 2011 - Feb. 28, 2012 [3 MONTHS]

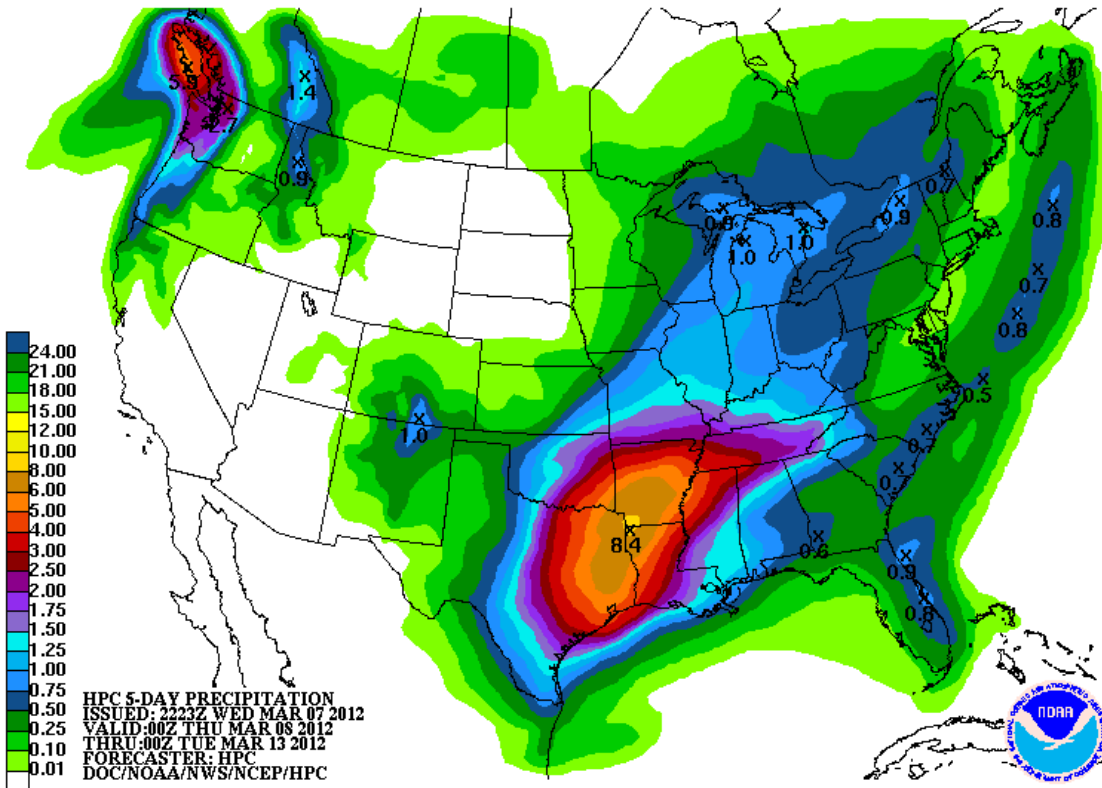
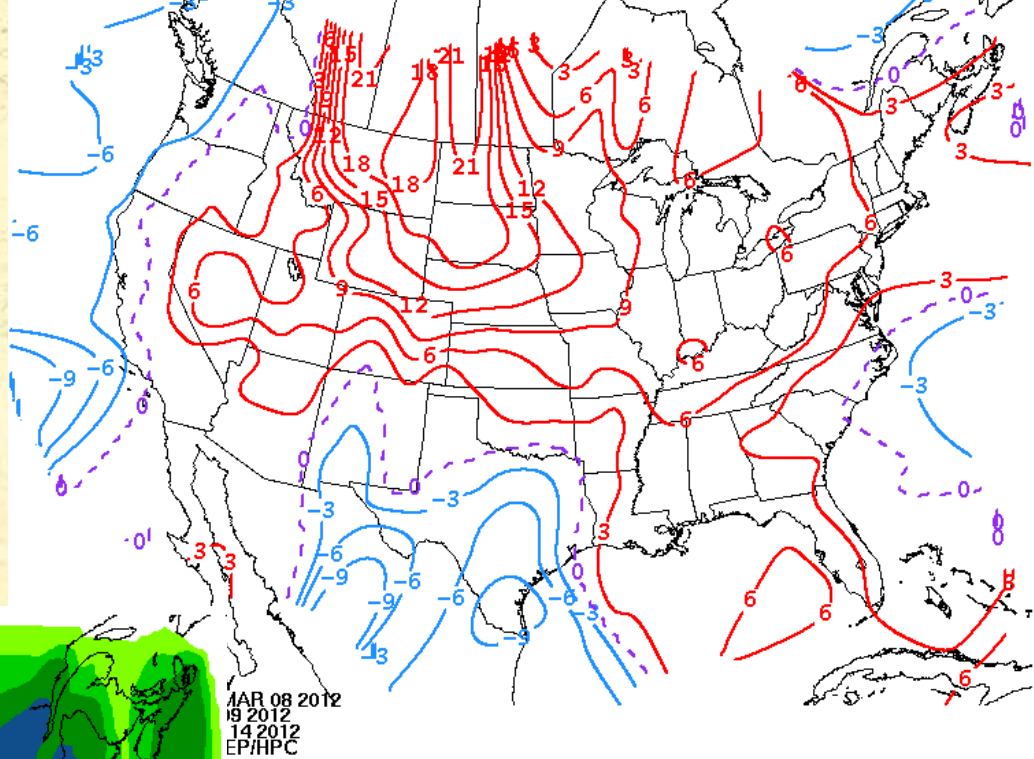


U.S. Drought Monitor Change Maps

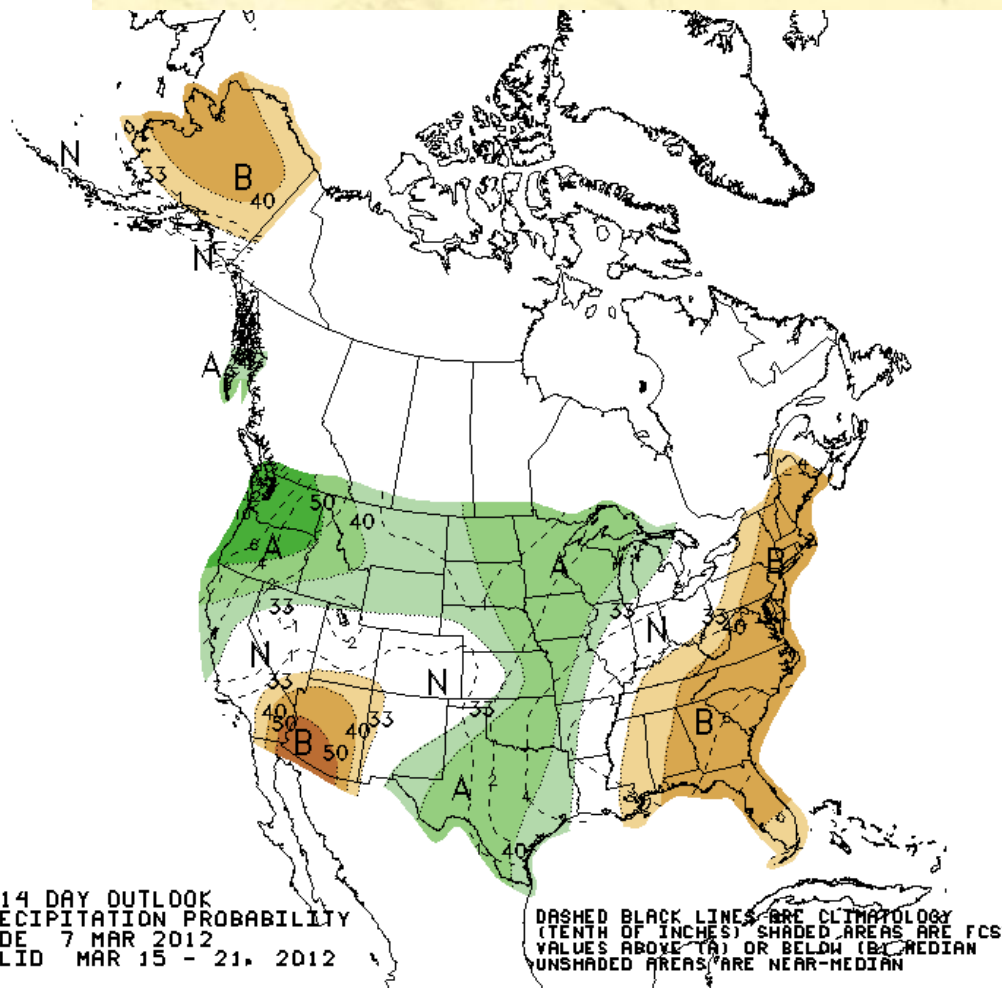
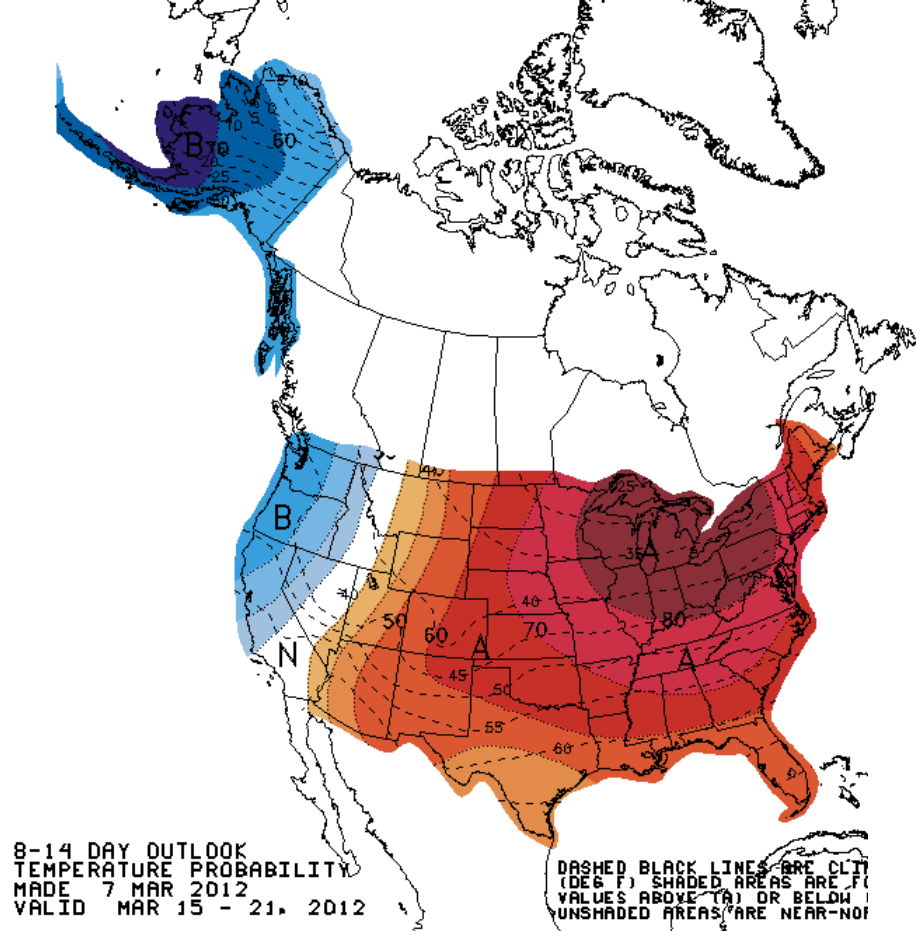
Aug. 30, 2011 - Feb. 28, 2012 [6 MONTHS]

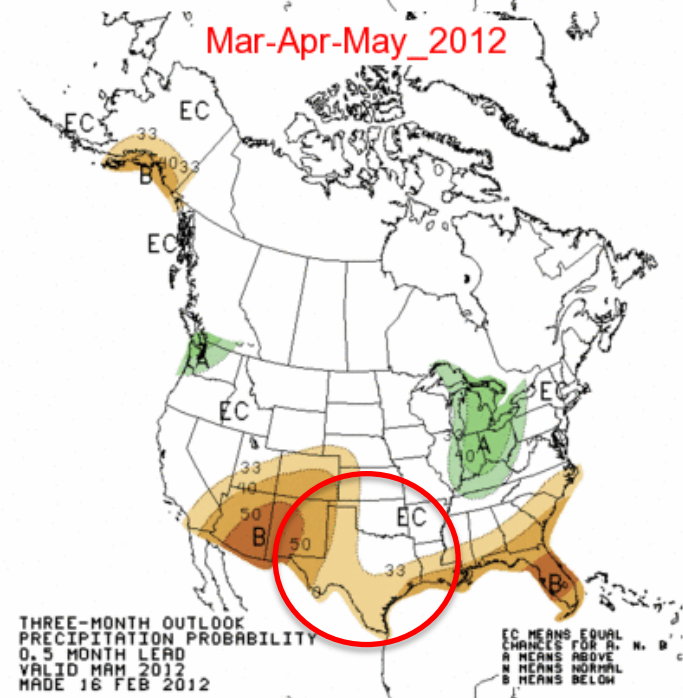
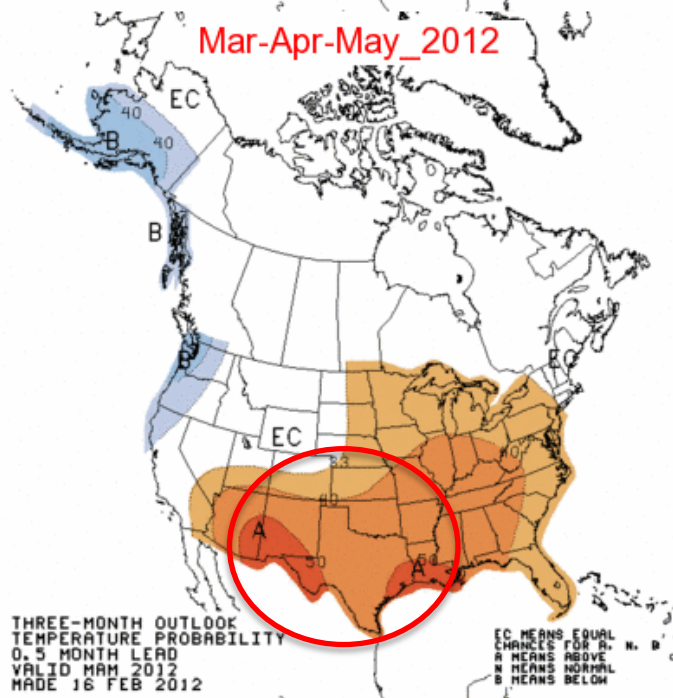
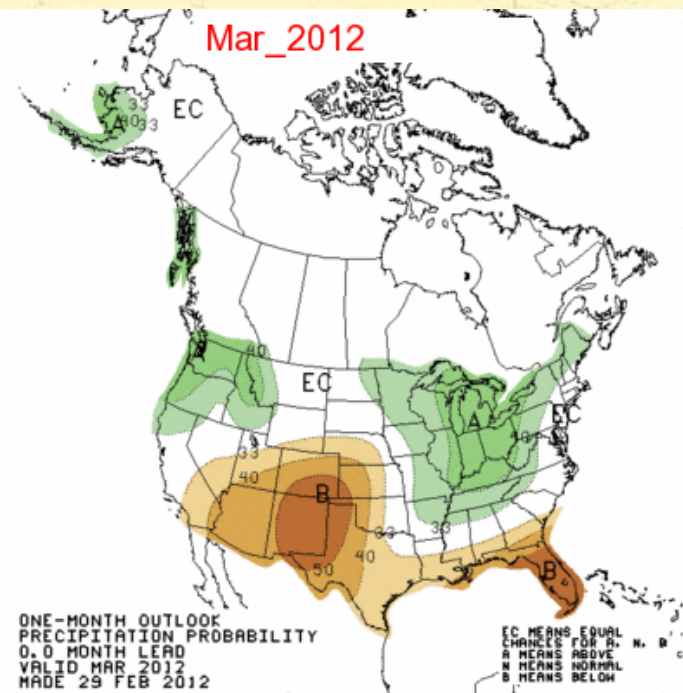
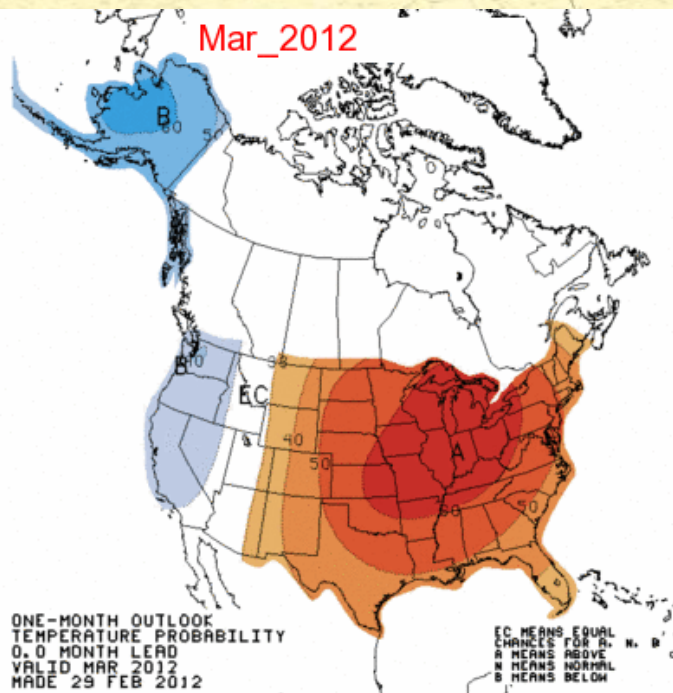


HPC 5-Day Outlook

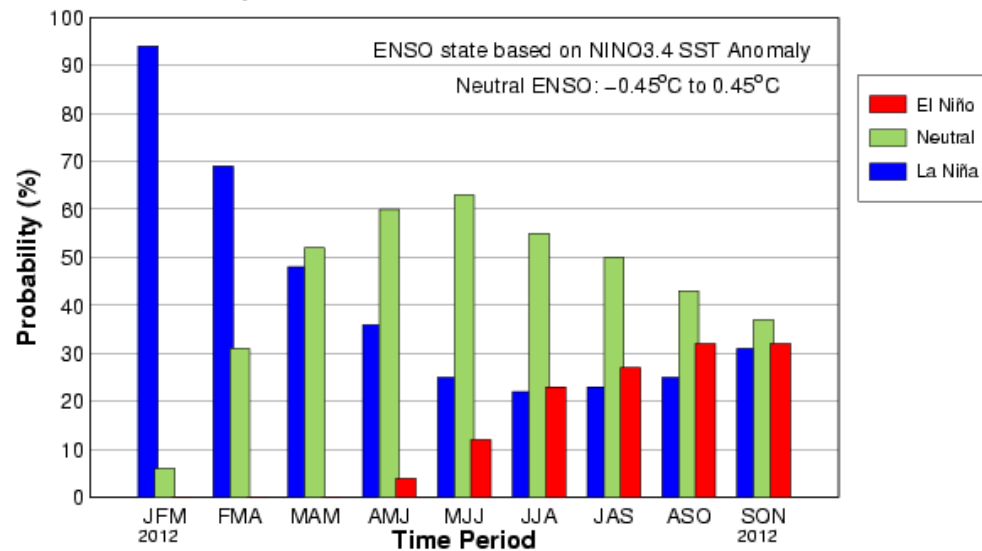


CPC 8-14-Day Outlooks

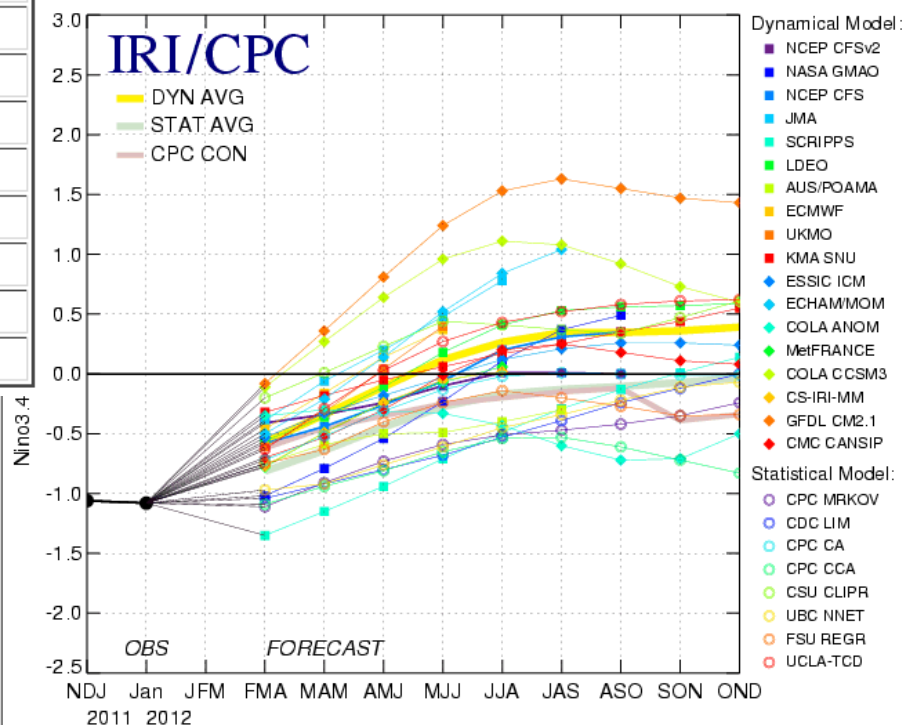




Official Early-Feb CPC/IRI Consensus Probabilistic ENSO Forecast



Mid-Feb 2012 Plume of Model ENSO Predictions



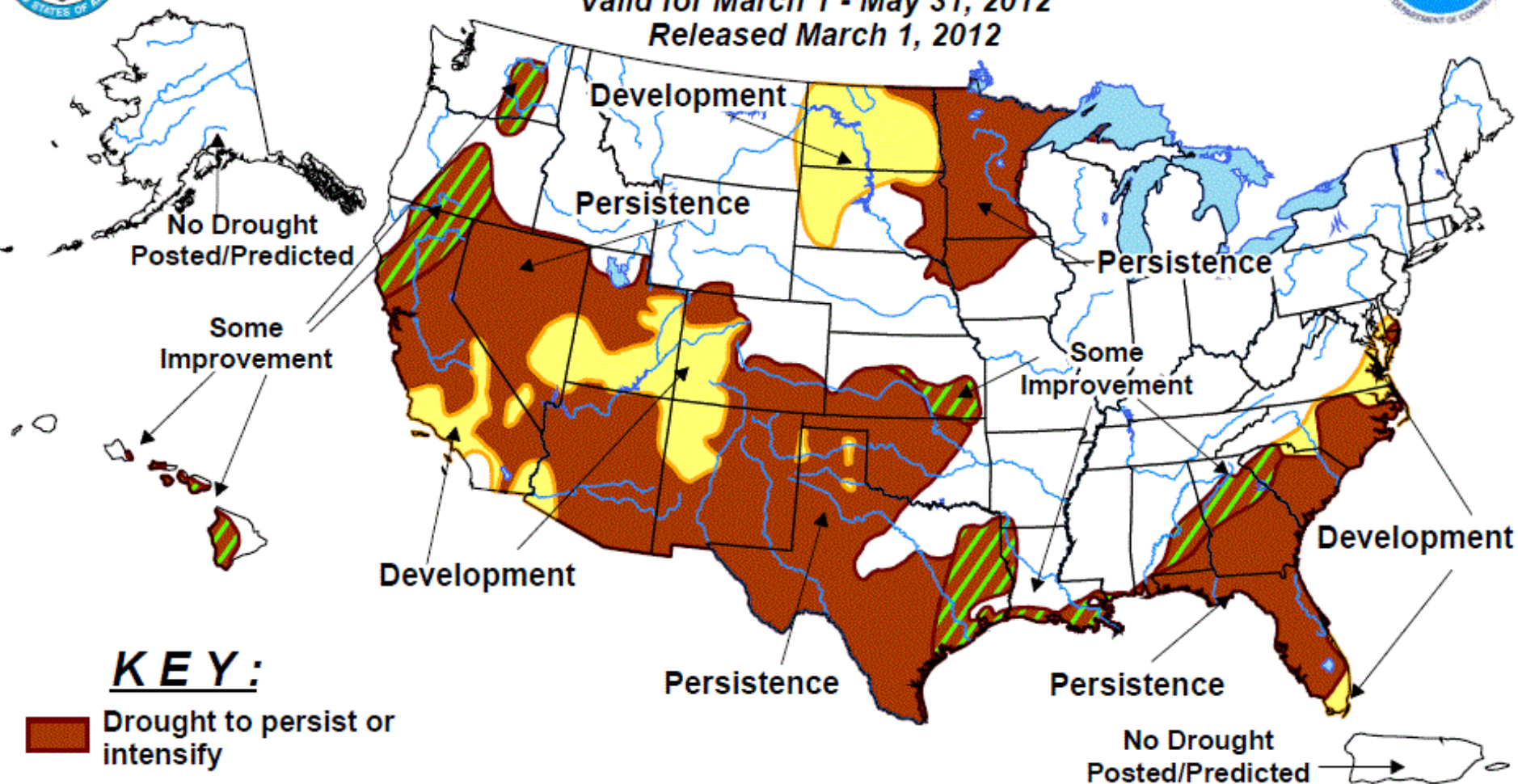


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for March 1 - May 31, 2012

Released March 1, 2012



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Contact Information:

Brian Fuchs
bfuchs2@unl.edu
402-472-6775

National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln



The U.S. Drought Monitor: A Composite Indicator Approach

**Mark Svoboda, Climatologist
Monitoring Program Area Leader
National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln**

NASA GOM Drought Products User Meeting, Huntsville, AL, February 14, 2012

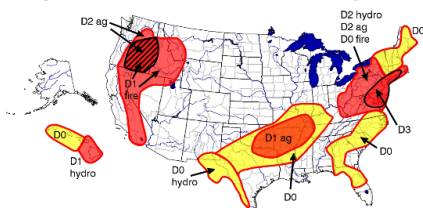
The U.S. Drought Monitor

Since 1999, **NOAA (CPC, NCDC, WRCC), USDA, and the NDMC** have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal agencies

- **Western Region Climate Center** on board 2008
- **11** authors in all
- **Incorporate** relevant information and products from all entities (and levels of government) dealing with drought (RCC's, SC's, federal/state agencies, etc.) (**~325 experts**)

August 3, 1999

Experimental U.S. Drought Monitor



N

"Drought" means moisture shortages leading to damaged crops or pastures, high wildfire risk, or water shortages. The map is based on information from many sources, including both satellite and surface data, and it focuses on widespread drought. Local conditions may vary.

Yellow (D0) = Drought Watch Area (abnormally dry but not full drought status)

Red (D1-D4) = Current drought ranging in severity from standard (D1) to severe (D2-D3) to extreme (D4)

Crosshatching = Overlapping drought type areas

Drought type: Used when impacts differ

Ag = agricultural (crops, grasslands)

Fire = forestry (wildfire potential)

Hydro = hydrological (rivers, wells, reservoirs)

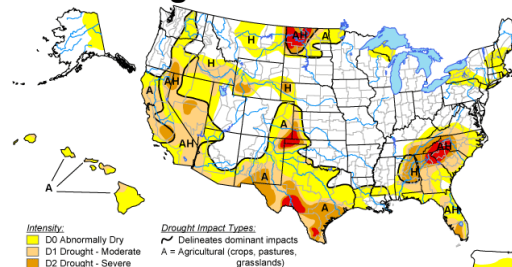
Plus (+) = Forecast to intensify

Minus (-) = Forecast to diminish



U.S. Drought Monitor

June 10, 2008
Valid 8 a.m. EDT



Intensity:

D0 Abnormally Dry

D1 Drought - Moderate

D2 Drought - Severe

D3 Drought - Extreme

D4 Drought - Exceptional

Drought Impact Types:

A = Agricultural (crops, pastures, grasslands)

H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

Released Thursday, June 12, 2008
Author: Mark Svoboda, National Drought Mitigation Center



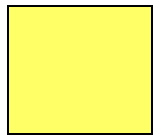
Objectives



- “Fujita-like” scale
- **NOT** a forecast!
- **NOT** a drought declaration!
- Identify **impacts** (A, H)
- Assessment of **current** conditions
- Incorporate **local expert** input
- Be as **objective** as possible

U.S. Drought Monitor Map

Drought Intensity Categories



D0 **Abnormally Dry (30%tile)**



D1 Drought – **Moderate (20%tile)**



D2 Drought – **Severe (10%tile)**



D3 Drought – **Extreme (5%tile)**

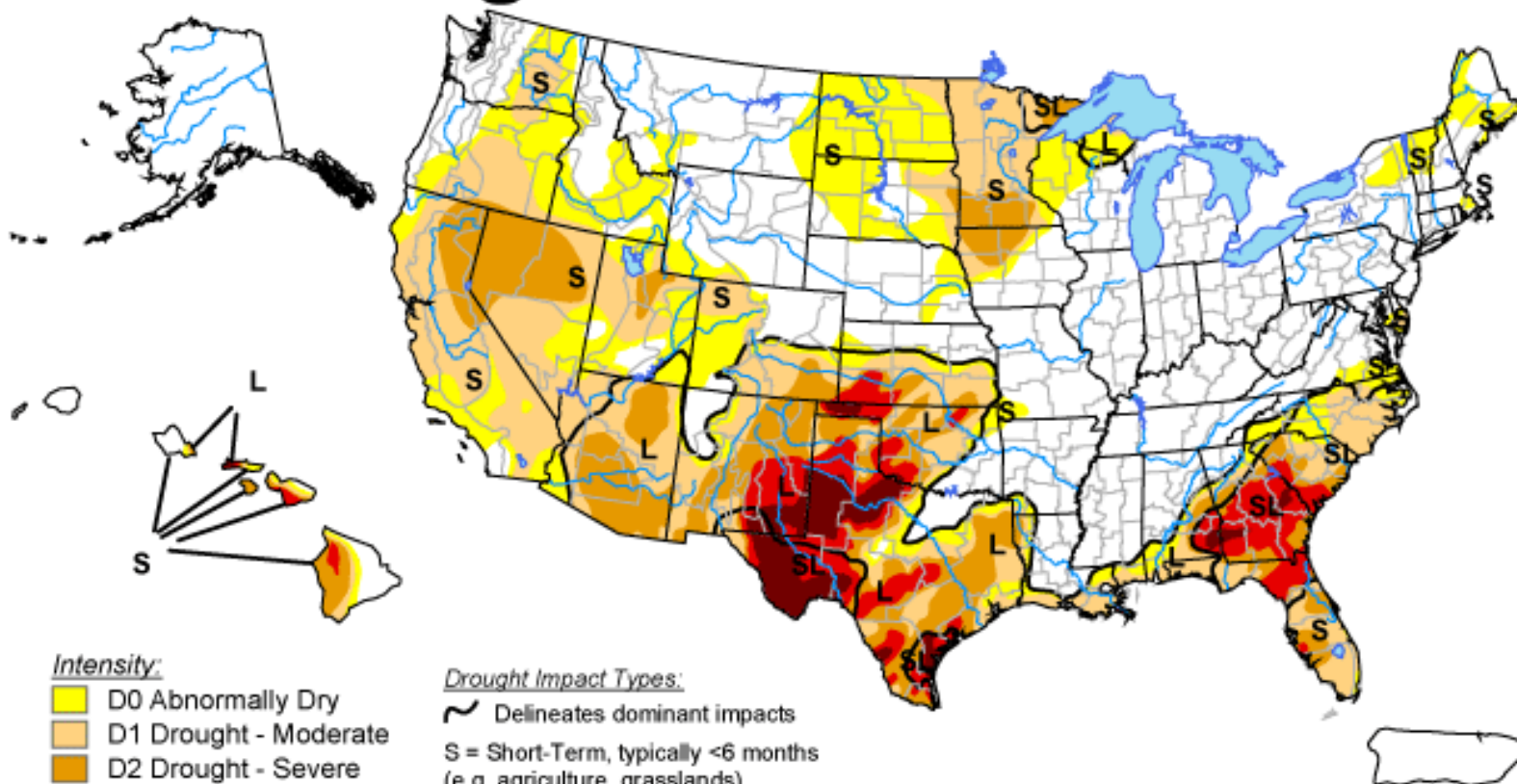


D4 Drought – **Exceptional (2%tile)**

U.S. Drought Monitor

March 6, 2012

Valid 7 a.m. EST



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
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Released Thursday, March 8, 2012

Author: Michael Brewer/L. Love-Brotak, NOAA/NESDIS/NCDC

U.S. Drought Monitor

Integrates Key Drought Indicators:

- Palmer Drought Index
- SPI
- KBDI
- Modeled Soil Moisture
- 7-Day Avg. Streamflow
- Precipitation Anomalies

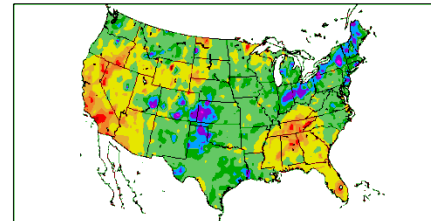
Growing Season:

- Crop Moisture Index
- Sat. Veg. Health Index
- Soil Moisture
- Mesonet data

In The West:

- SWSI
- Reservoir levels
- Snowpack (SNOTEL)
- SWE
- Streamflow

Water Year SPI
10/1/2006 - 4/19/2007

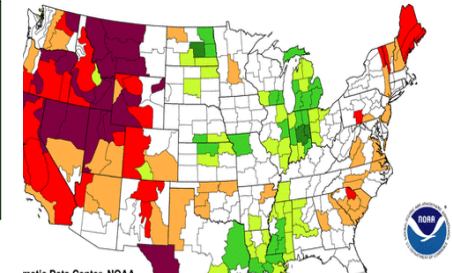


Generated 4/20/2007 at HPRC using provisional data.

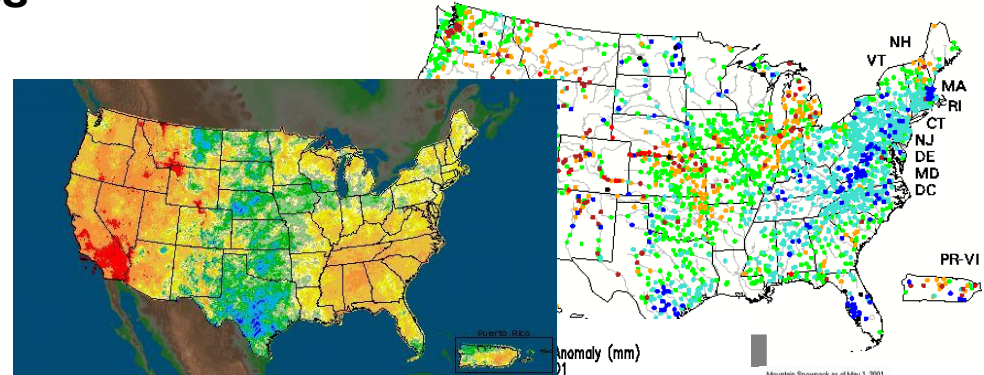
National Drought Mitigation Center

Palmer Drought Index
Long-Term (Meteorological) Conditions

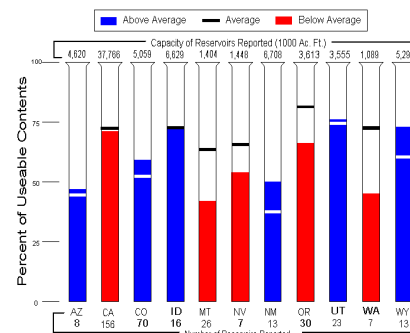
October 21, 2001 - October 27, 2001



Sunday, December 22, 2002



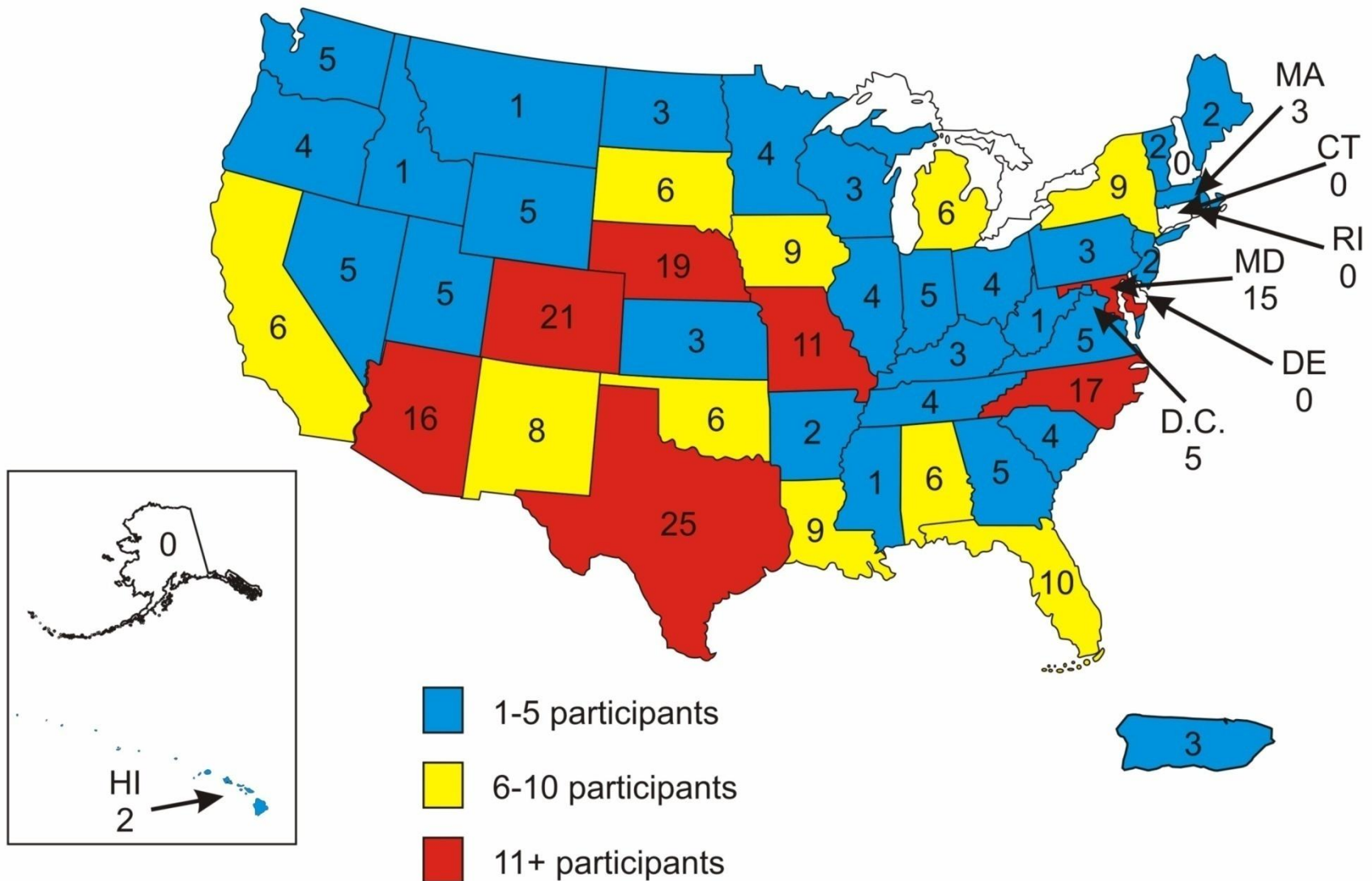
Reservoir Storage as of May 1, 2001



Prepared by: USDA, Natural Resources Conservation Service, National Water and Climate Center, Portland, OR
http://www.wcc.nrcs.usda.gov

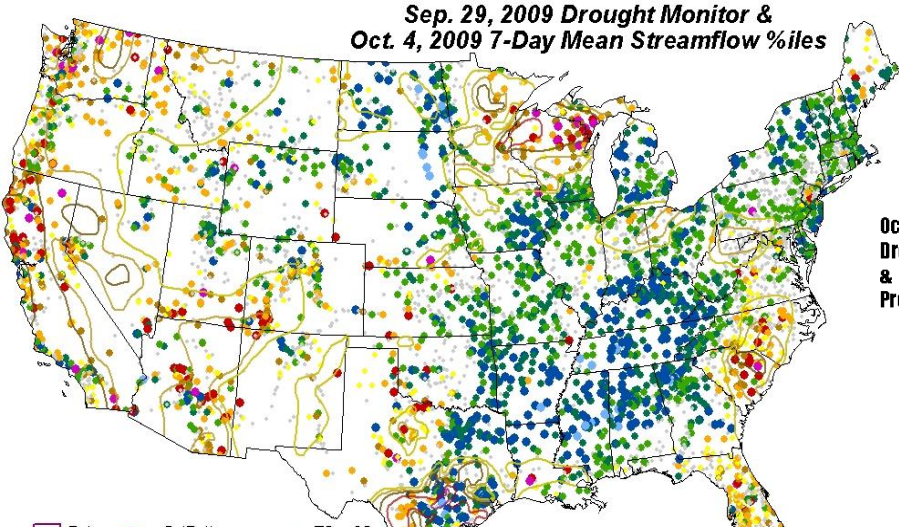
USDM Listserve Subscribers

(as of April 1, 2011)

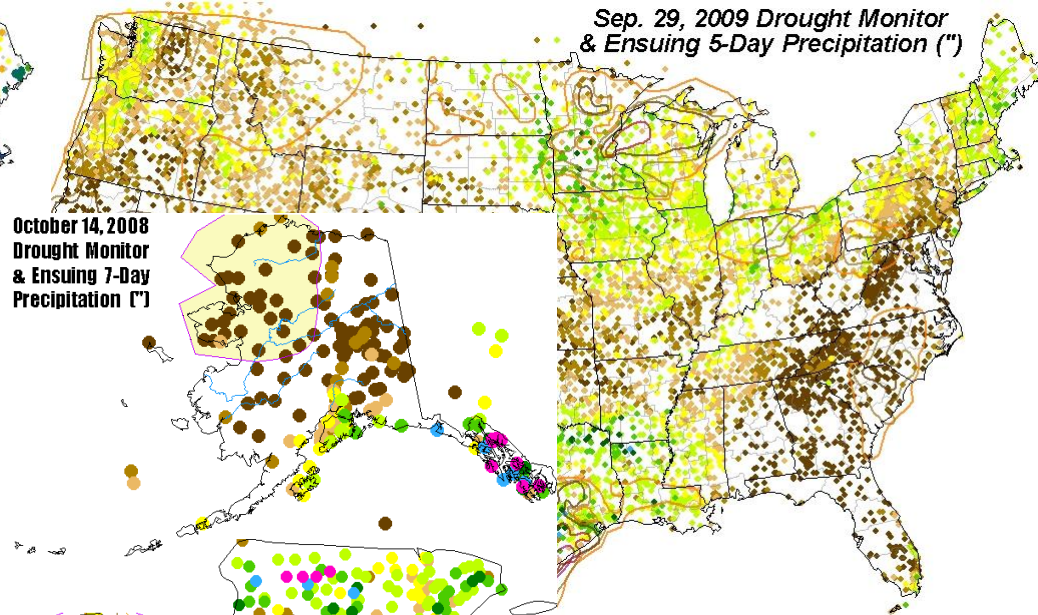


Total: 298 (does not include 1 participant from Canada and 1 participant from Mexico)

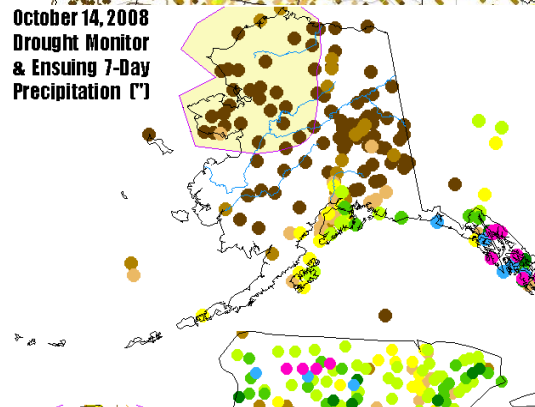
Sep. 29, 2009 Drought Monitor &
Oct. 4, 2009 7-Day Mean Streamflow %iles



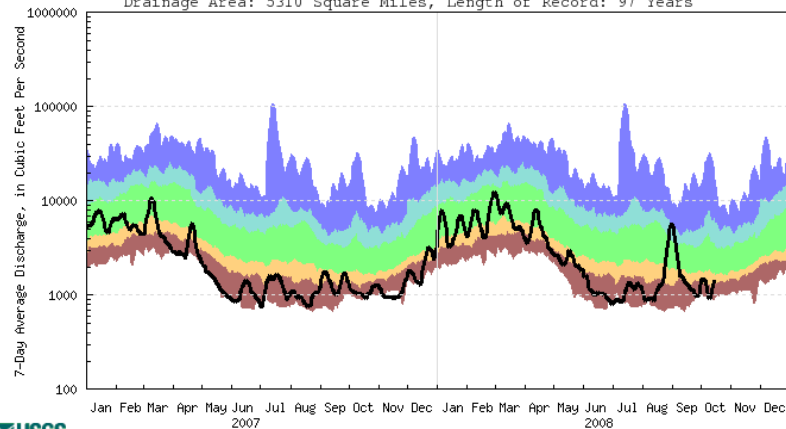
Sep. 29, 2009 Drought Monitor
& Ensuing 5-Day Precipitation (")



October 14, 2008
Drought Monitor
& Ensuing 7-Day
Precipitation (")



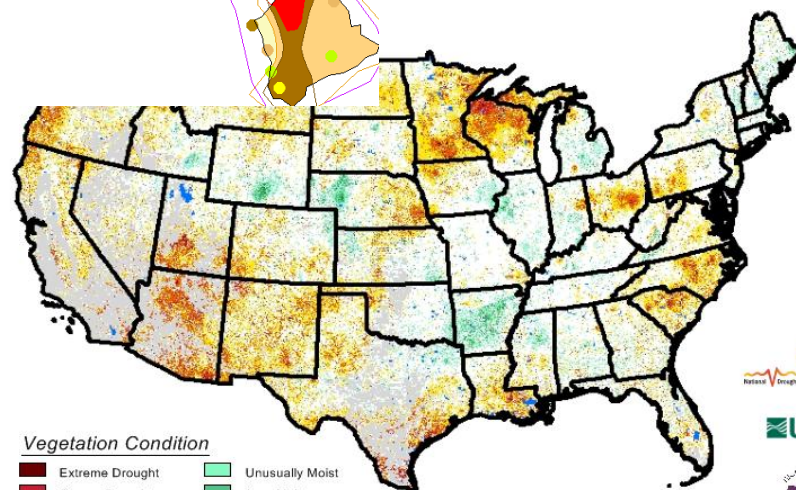
USGS 02352500 FLINT RIVER AT ALBANY, GA
Drainage Area: 5310 Square Miles, Length of Record: 97 Years



- 0.0
- 0.1 - 0.2
- 0.3 - 0.5
- 0.6 - 0.9
- 1.0 - 1.9
- 2.0 - 2.9
- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 8.1

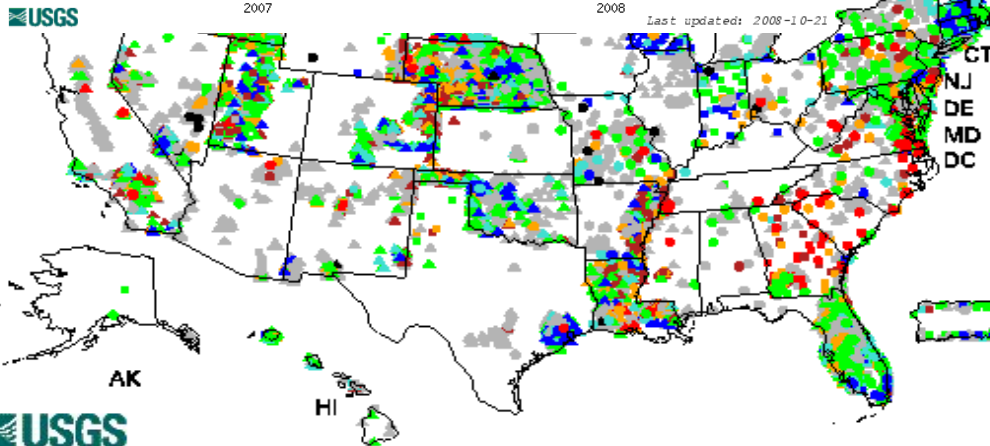
Base Index

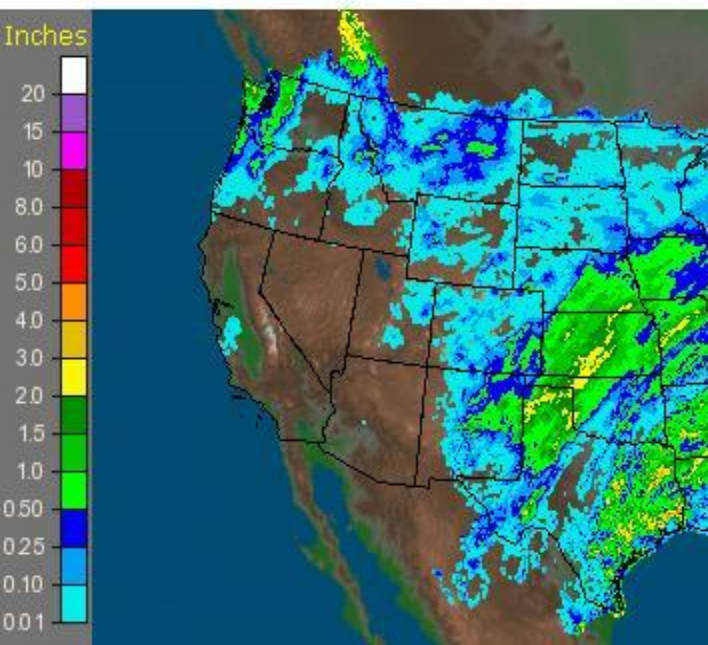
September 21, 2009



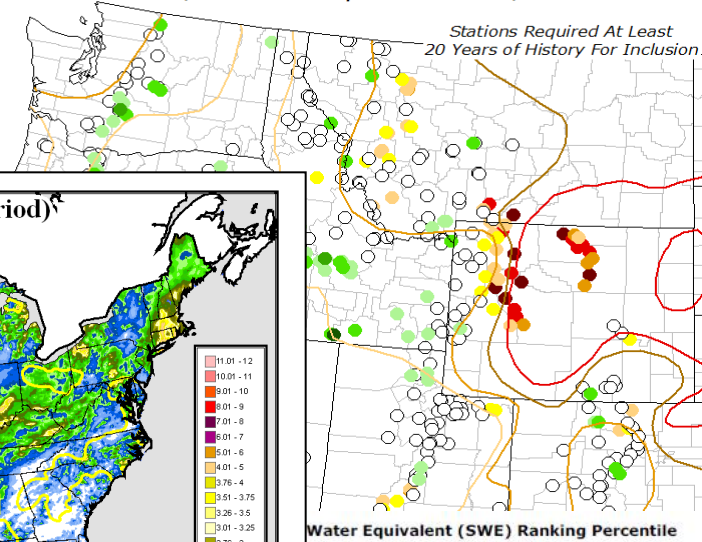
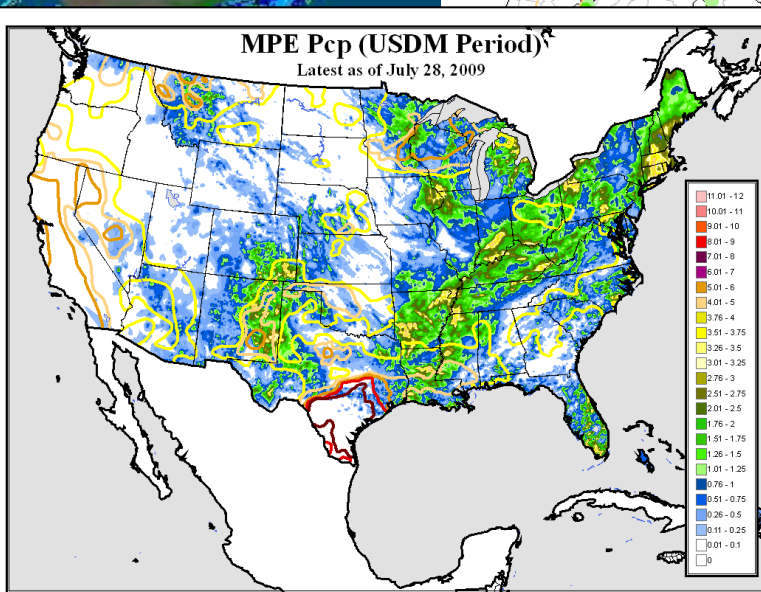
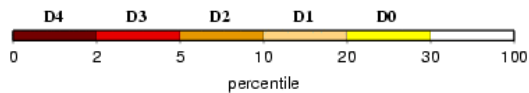
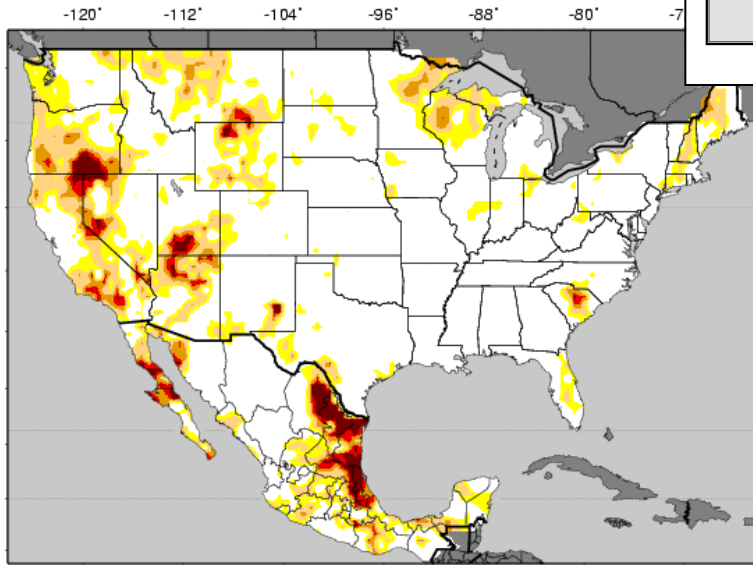
Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water





VIC Soil Moisture Percentiles (wrt/ 1916-2004)
20090930



Stations Required At Least
20 Years of History For Inclusion

Water Equivalent (SWE) Ranking Percentile

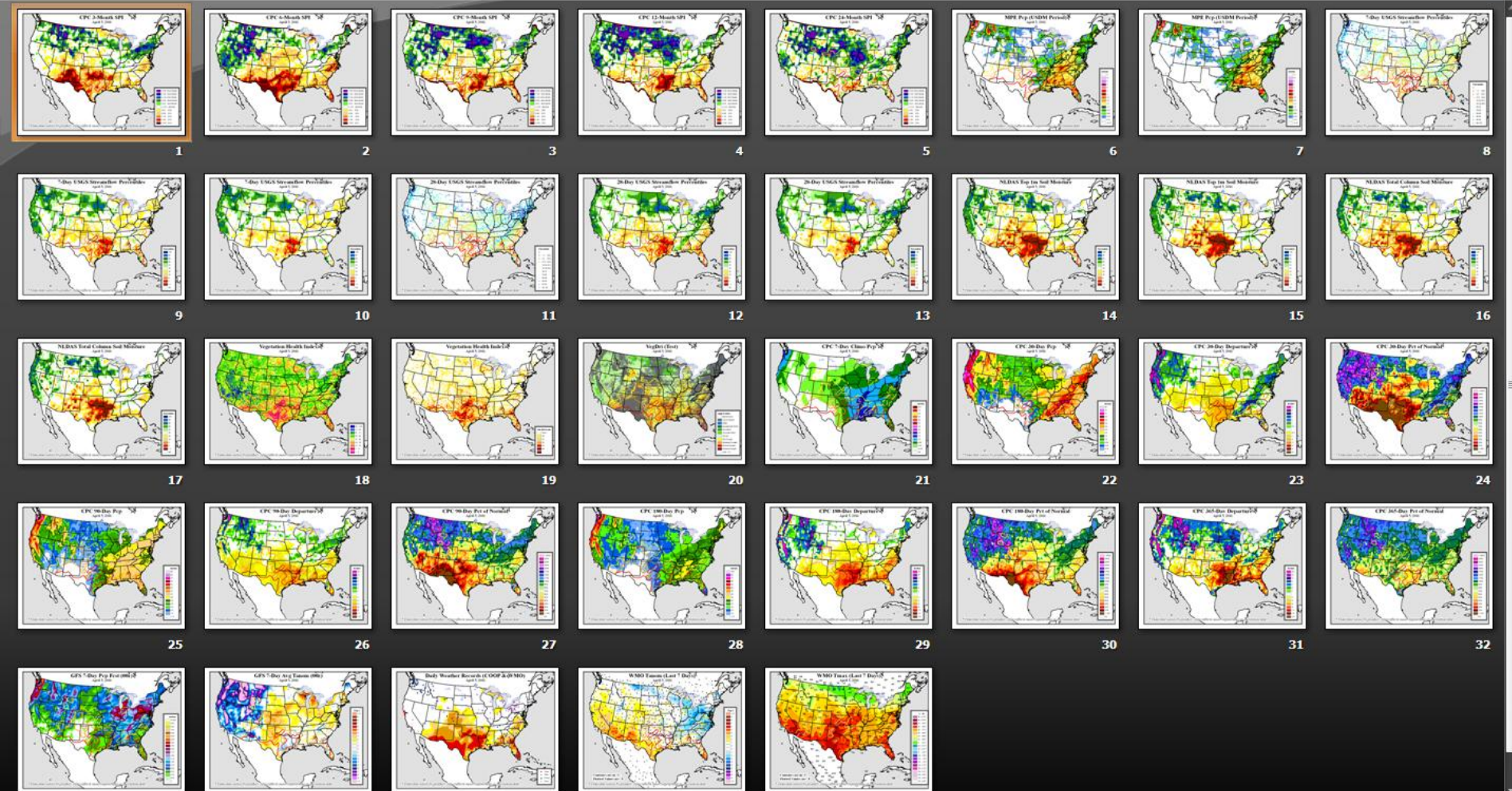
Current
Snow Water
Equivalent (SWE)
Ranking
Percentile

- ★ wettest 5%
- ▲ 91% - 95%
- ▲ 81% - 90%
- ▲ 71% - 80%
- ▲ 61% - 70%
- ▲ 51% - 60%
- ▲ 41% - 50%
- ▲ 31% - 40%
- ▲ 21% - 30%
- ▲ 11% - 20%
- ▲ 0% - 10%
- ★ driest 5%
- snow free

Provisional Data
Subject to Revision



Analysis includes sites with more than 20 years of historical data.
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.nrcs.usda.gov/gis/>
Based on data from ftp://ftp.nrcs.usda.gov/data/water/wcc/sis/data
Science contact: Tom Pagano@nrcs.usda.gov 503 414 3010



USDM prep inputs 110405 - Microsoft PowerPoint

Home H Insert N Design G Animations A Slide Show S Review R View V Add-Ins X

25 March 25, 2011 Drought Monitor
A Weekly Early Prediction

26 March 25, 2011 Drought Monitor
A Weekly Early Prediction

27 March 25, 2011 Drought Monitor
A Weekly Early Prediction

28 March 25, 2011 Drought Monitor
A Weekly Early Prediction

29 March 25, 2011 Drought Monitor
A Weekly Early Prediction

30 March 25, 2011 Drought Monitor
A Weekly Early Prediction

31 March 25, 2011 Drought Monitor
A Weekly Early Prediction

32 March 25, 2011 Drought Monitor
A Weekly Early Prediction

33 March 25, 2011 Drought Monitor
A Weekly Early Prediction

34 March 25, 2011 Drought Monitor
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35 March 25, 2011 Drought Monitor
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36 March 25, 2011 Drought Monitor
A Weekly Early Prediction

37 March 25, 2011 Drought Monitor
A Weekly Early Prediction

38 March 25, 2011 Drought Monitor
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49 March 25, 2011 Drought Monitor
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51 March 25, 2011 Drought Monitor
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52 March 25, 2011 Drought Monitor
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53 March 25, 2011 Drought Monitor
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54 March 25, 2011 Drought Monitor
A Weekly Early Prediction

55 March 25, 2011 Drought Monitor
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56 March 25, 2011 Drought Monitor
A Weekly Early Prediction

57 March 25, 2011 Drought Monitor
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58 March 25, 2011 Drought Monitor
A Weekly Early Prediction

59 March 25, 2011 Drought Monitor
A Weekly Early Prediction

60 March 25, 2011 Drought Monitor
A Weekly Early Prediction

61 March 25, 2011 Drought Monitor
A Weekly Early Prediction

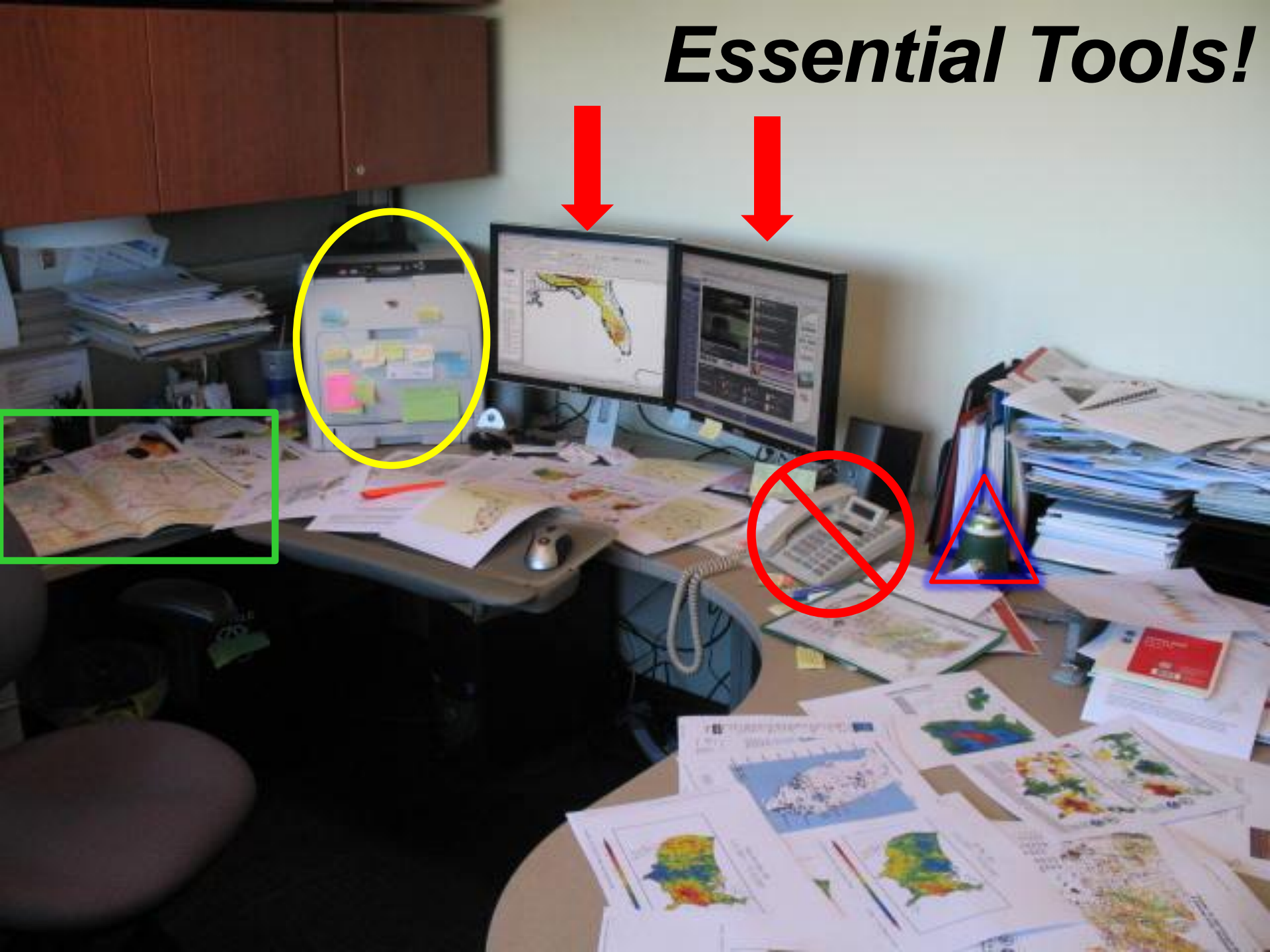
62 March 25, 2011 Drought Monitor
A Weekly Early Prediction

63 March 25, 2011 Drought Monitor
A Weekly Early Prediction

64 March 25, 2011 Drought Monitor
A Weekly Early Prediction

Slide Sorter "Office Theme" 66%

Essential Tools!



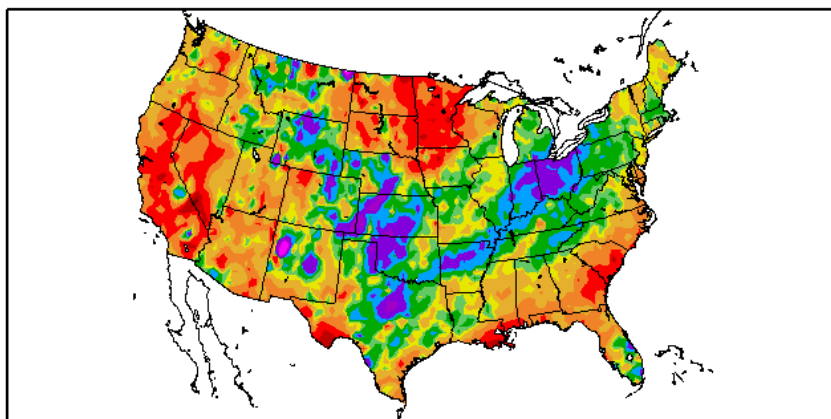
What has happened since last week?

- Comments from last week's author
- Last week's changes
- Advance comments from experts
- Rain/snow in D0-D4 areas?
- No rain in D0-D4 areas...AND other areas?
- Weighing Short-term vs. Long-term

Precipitation, Streamflow and Other Indicators

- Typically look at the following suite of products at **30-**, **60-**, and **90-**days, **Year-to-date**, **Water Year-to-date**, **12-**months and **24** months (out to **60** months in the West).

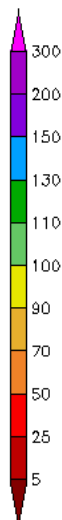
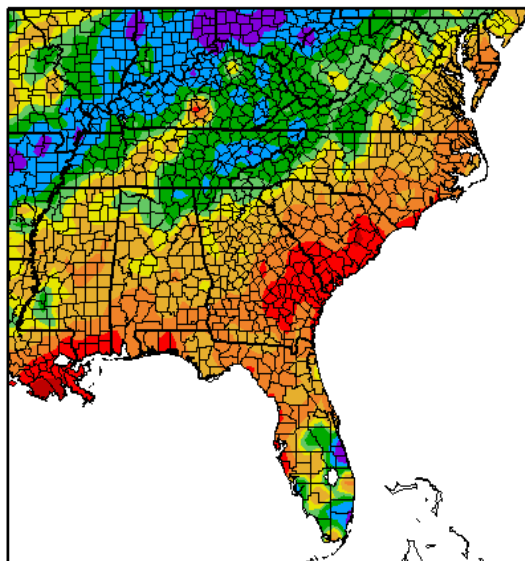
Percent of Normal Precipitation (%)
10/1/2011 – 2/7/2012



Generated 2/8/2012 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
10/1/2011 – 2/7/2012

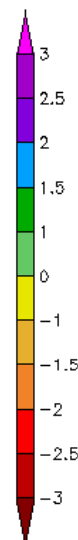
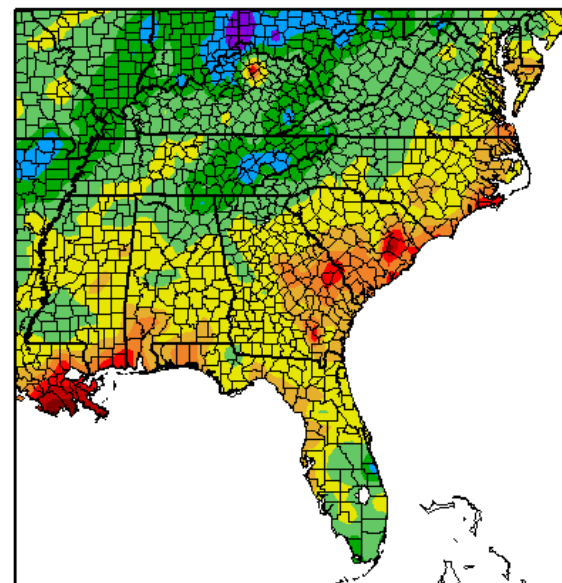


Generated 2/8/2012 at HPRCC using provisional data.

Regional Climate Centers

Applied Climate Information System (ACIS) is a key player.....

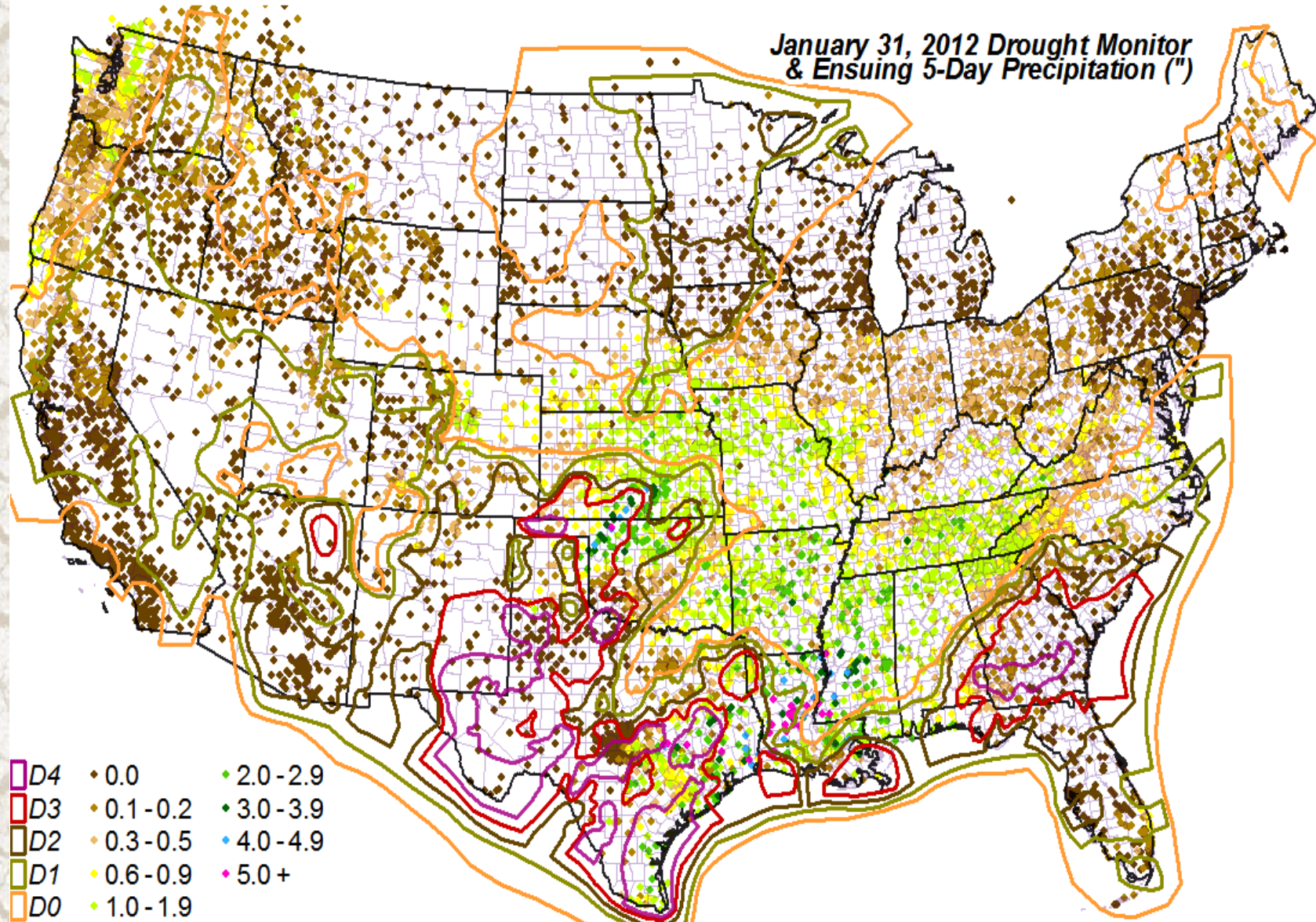
Water Year SPI
10/1/2011 – 2/7/2012



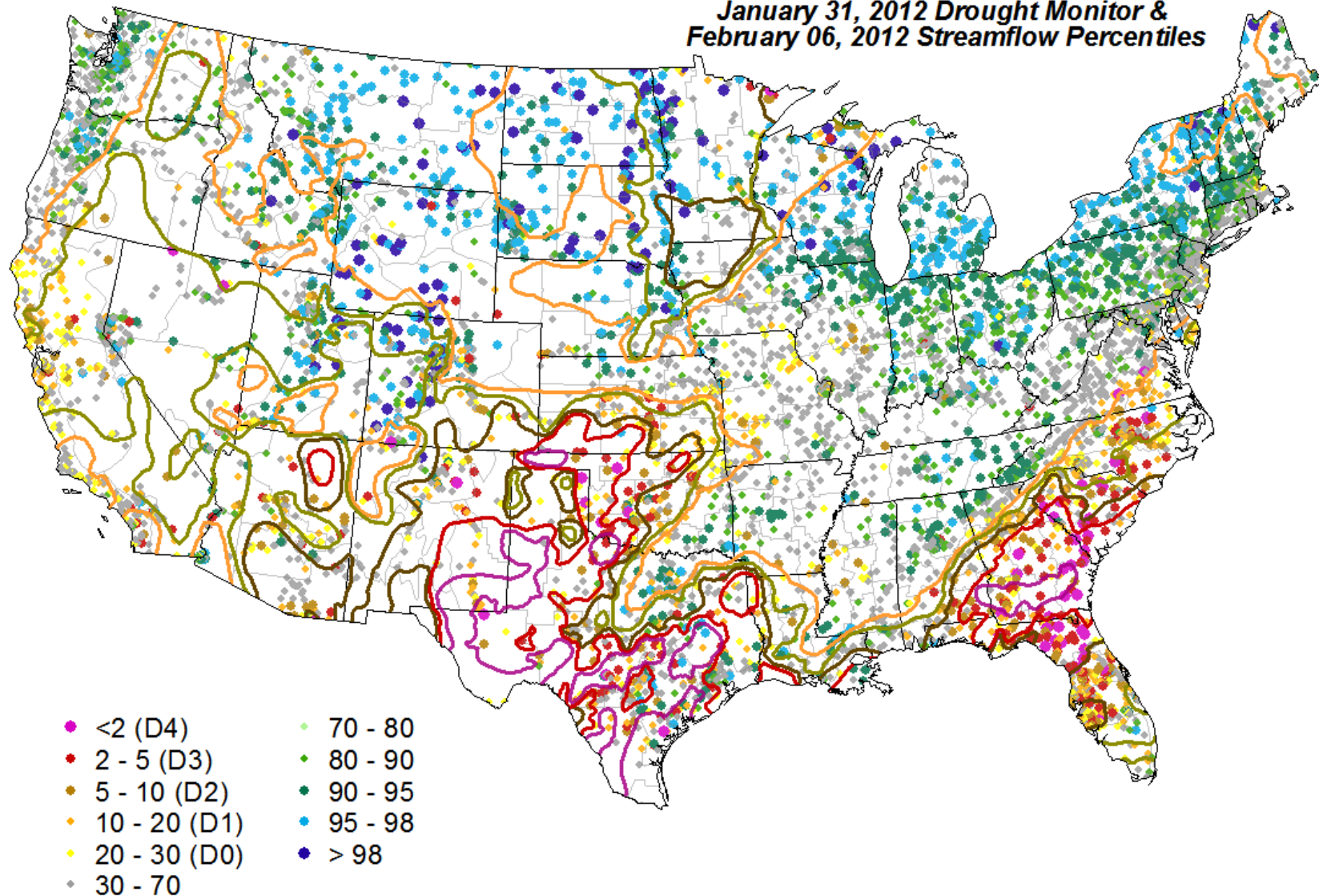
Generated 2/8/2012 at HPRCC using provisional data.

Regional Climate Centers

January 31, 2012 Drought Monitor
& Ensuing 5-Day Precipitation (")

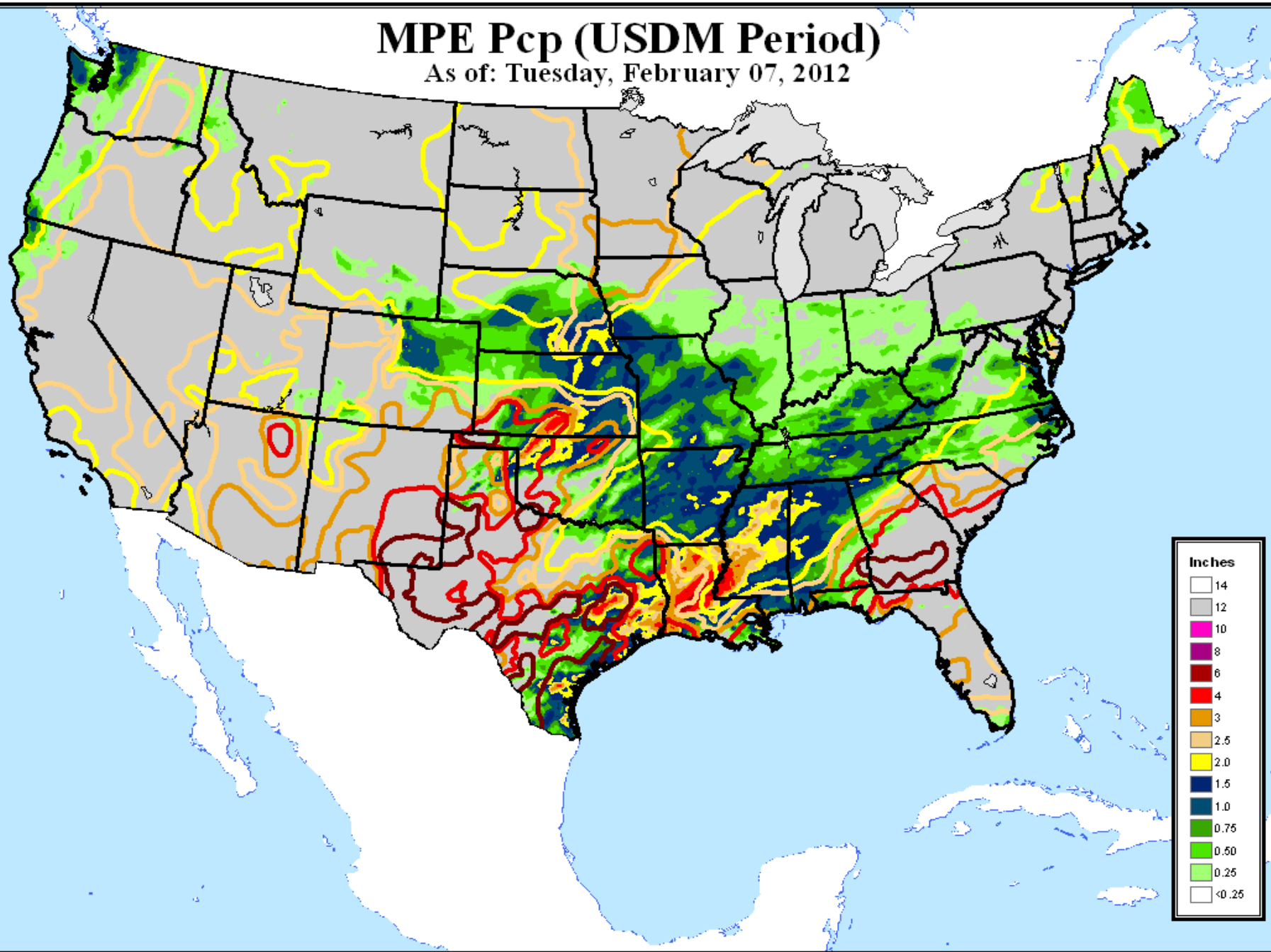


**January 31, 2012 Drought Monitor &
February 06, 2012 Streamflow Percentiles**



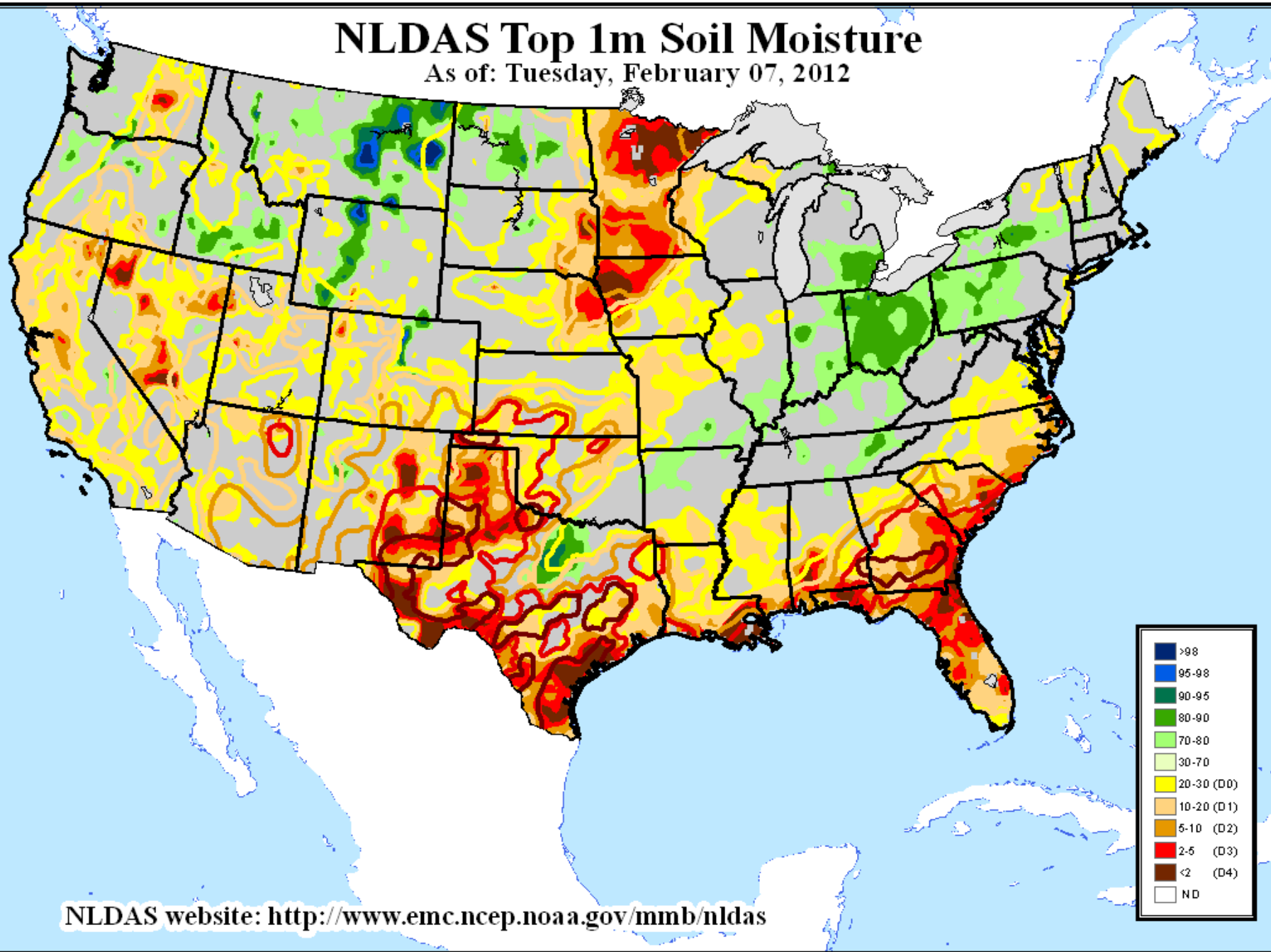
MPE Pcp (USDM Period)

As of: Tuesday, February 07, 2012



NLDAS Top 1m Soil Moisture

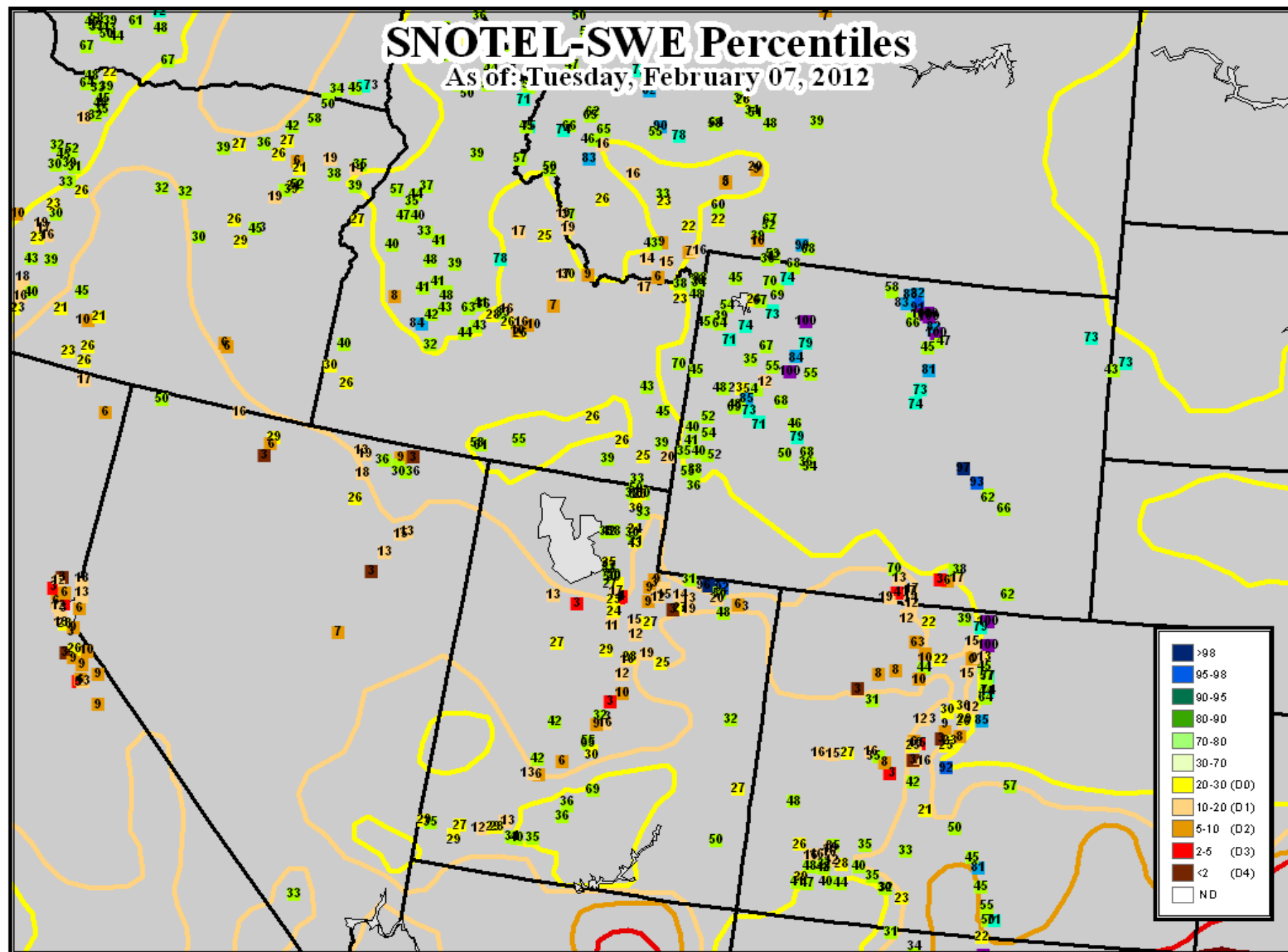
As of: Tuesday, February 07, 2012



NLDAS website: <http://www.emc.ncep.noaa.gov/mmb/nldas>

SNOTEL-SWE Percentiles

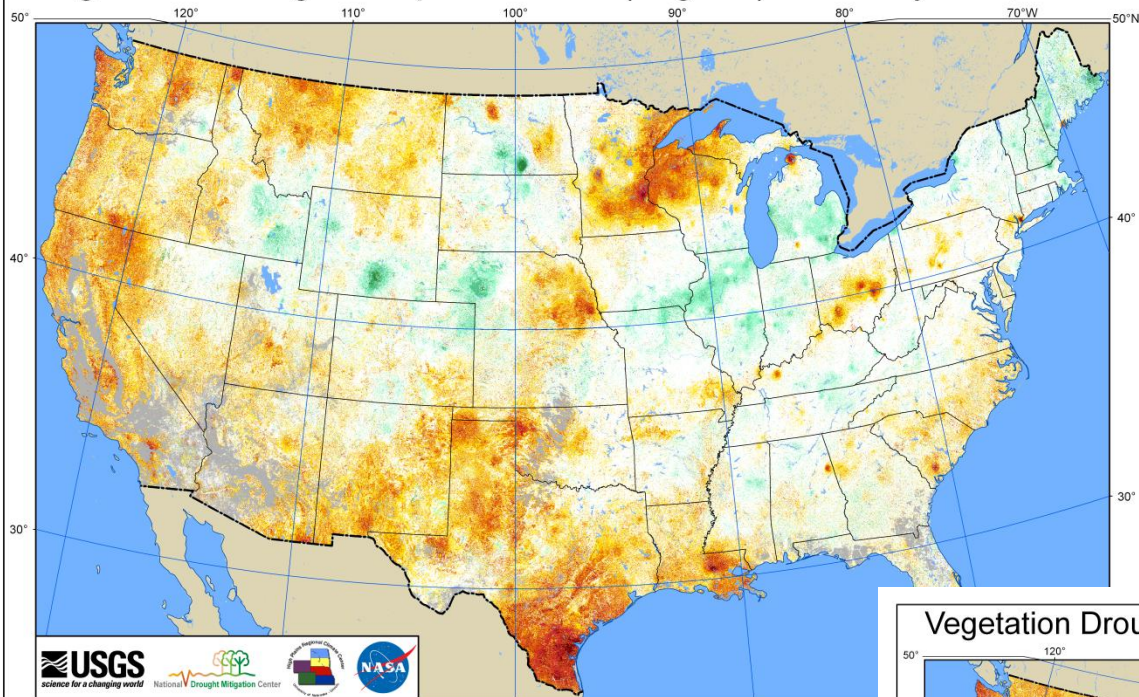
As of: Tuesday, February 07, 2012



Remote Sensing/Vegetation Health

Vegetation Drought Response Index (VegDRI)

July 19th, 2009



Vegetation Condition

Extreme Drought	Near Normal	Out Of Season
Severe Drought	Unusually Moist	Water
Moderate Drought	Very Moist	
Pre-Drought	Extremely Moist	

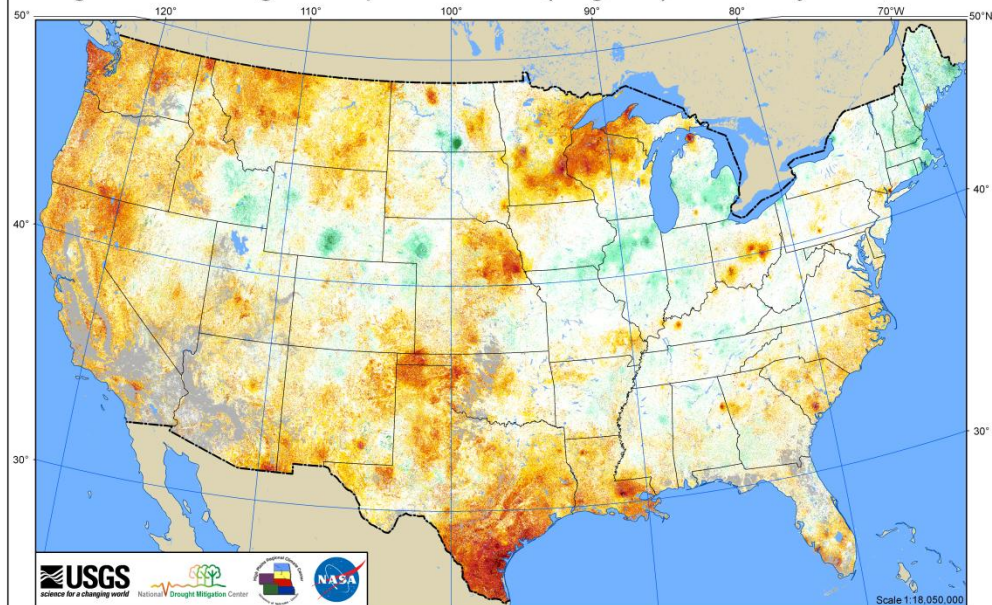
Data Source: eMODIS

Period: July 13 -

<http://gisdata.usgs.net/website/Droug>

Vegetation Drought Response Index (VegDRI)

July 26th, 2009



Vegetation Condition

Extreme Drought	Near Normal	Out Of Season
Severe Drought	Unusually Moist	Water
Moderate Drought	Very Moist	
Pre-Drought	Extremely Moist	

Data Source: eMODIS 7 Day Composite

Period: July 20 - July 26 (Week30)

http://gisdata.usgs.net/website/Drought_Monitoring/viewer.php

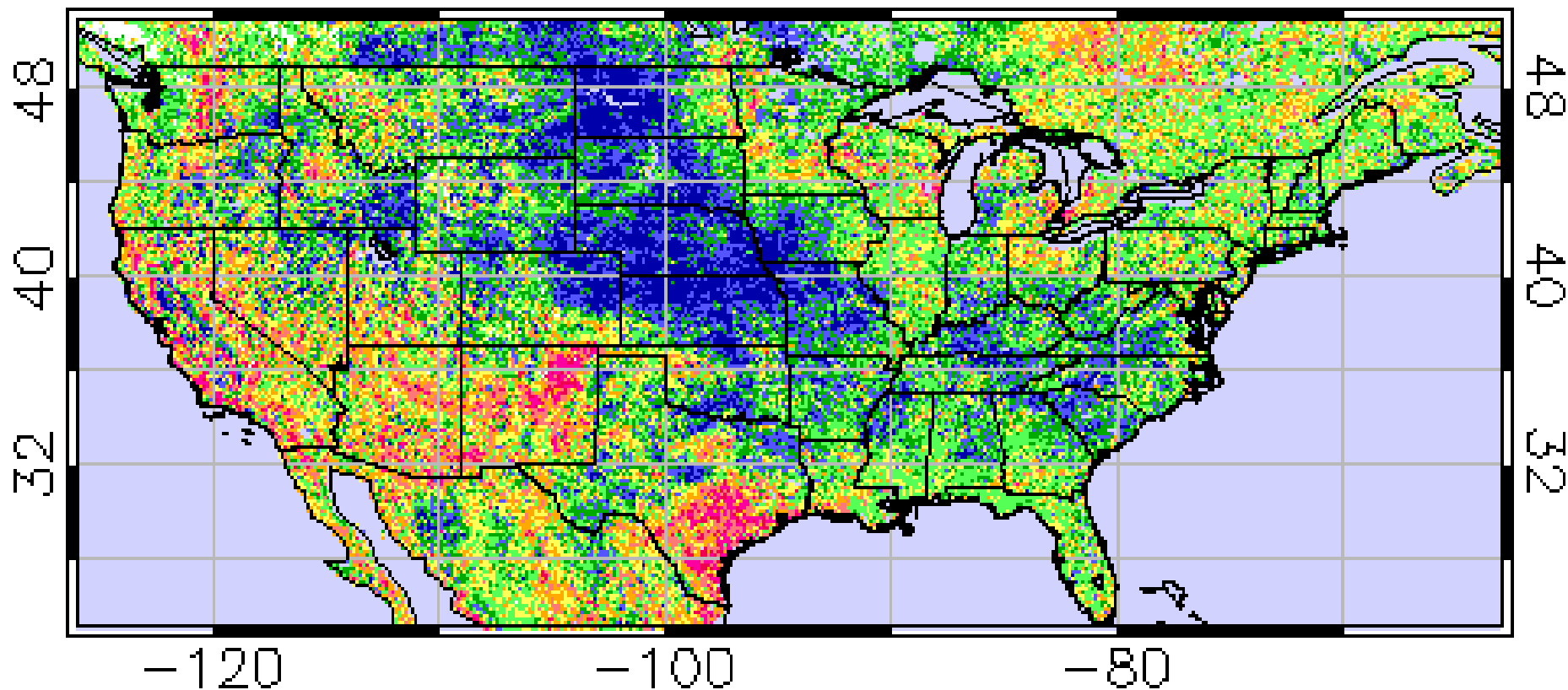
UNIVERSITY OF
Nebraska
Lincoln

July 22 2009 (week 29)

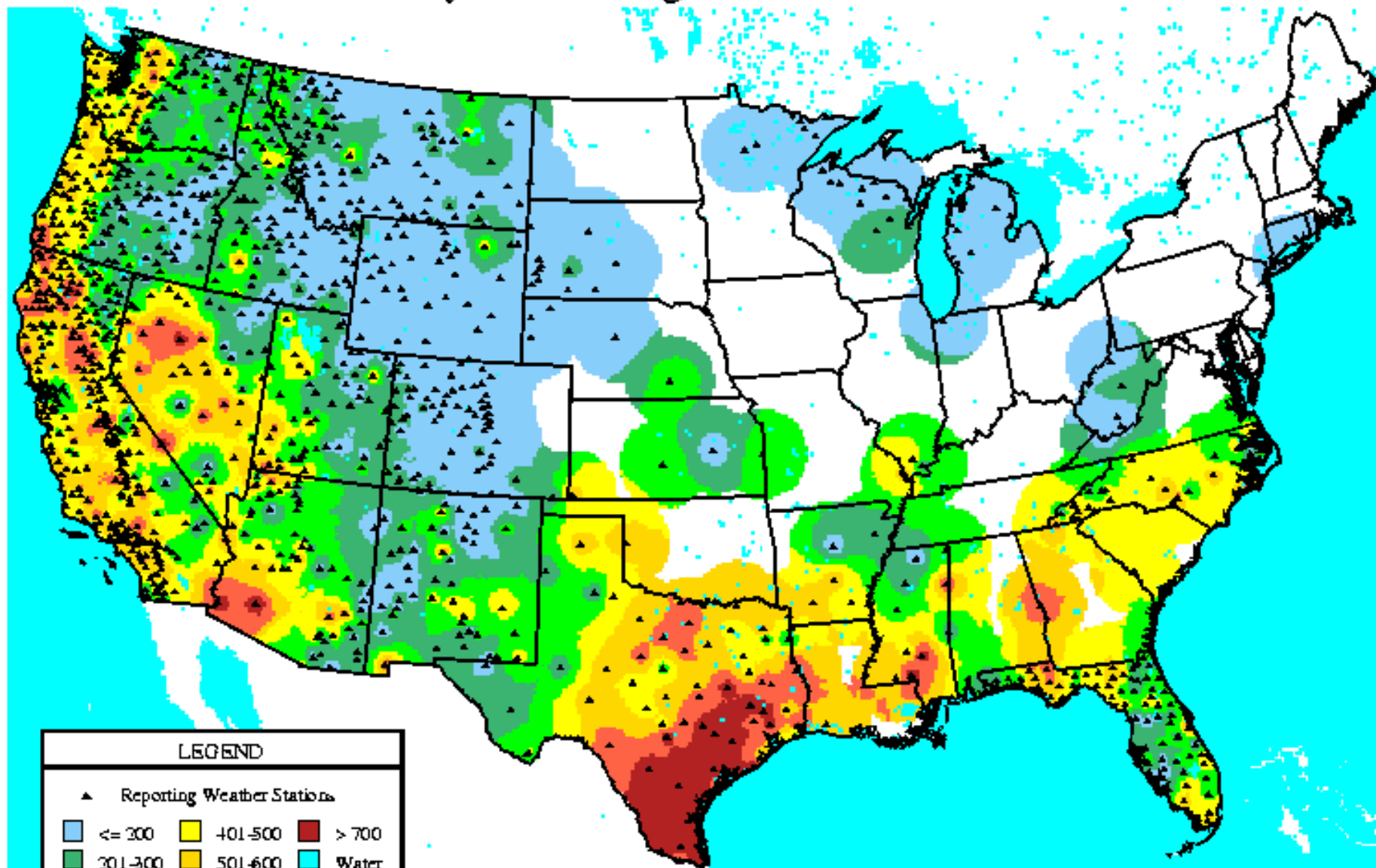
-120

-100

-80



Keetch-Byram Drought Index: 26-JUL-09



LEGEND

▲ Reporting Weather Stations

≤ 200	401-500	> 700
201-300	501-600	Water
301-400	601-700	

(Inv. Dist.¹ Interp.)

WFAS-MAPS Graphics FIRE BEHAVIOR RESEARCH MISSOULA, MT



The Importance of Local Expert Input

- The U.S. Drought Monitor Team Relies on Field Observation Feedback from the Local Experts for Impacts Information & “Ground Truth”

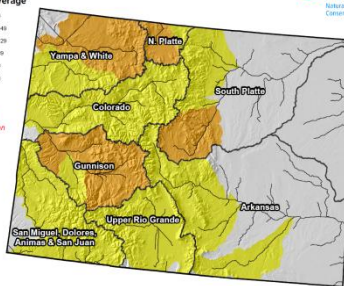
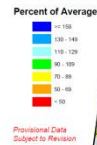
- Listserver (~325 Participants: 2/3 Federal, 1/3 State/Univ.)

- Local NWS & USDA/NRCS Offices
- State Climate Offices
- State Drought Task Forces
- Regional Climate Centers
- NIDIS Basin

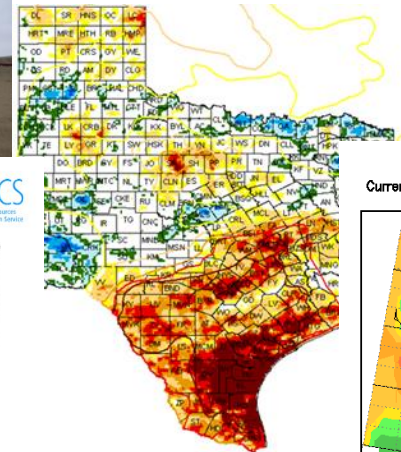
Webinars
Nebraska
Lincoln



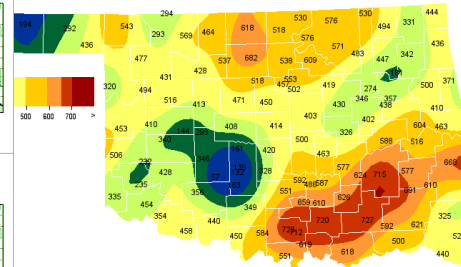
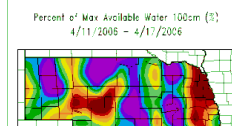
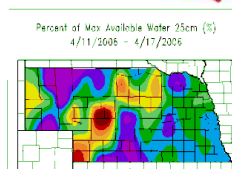
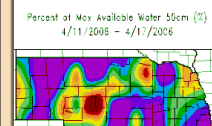
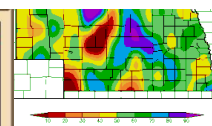
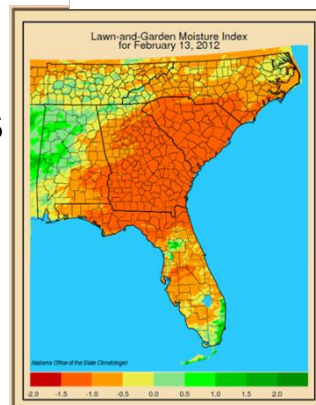
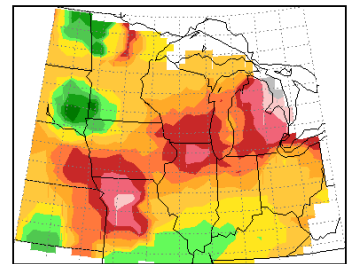
Colorado Streamflow Forecast Map



Current as of February 1, 2012



Current Soil Moisture March-23-2003



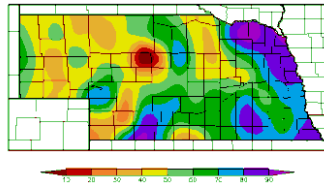
Copyright © 2006 Oklahoma Climatological Survey. All rights reserved. No warranty is made for use of this data for any purpose other than that for which it was collected.



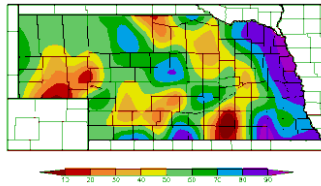
Regional and Local Products

- Various webinars/telecons/reports
- RCC's
- **SC's**
- NIDIS Pilot DEWS:
 - UCRB
 - **ACF**
 - CA next?
- NC, HI, TX, AZ, **AL**, FL

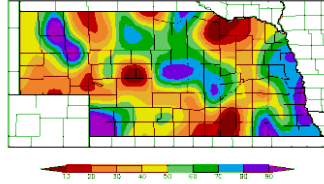
Percent of Max Available Water 10cm (%)
4/5/2011 - 4/11/2011



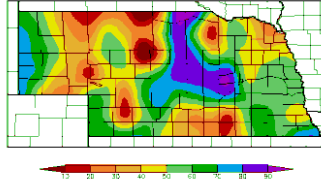
Percent of Max Available Water 25cm (%)
4/5/2011 - 4/11/2011



Percent of Max Available Water 50cm (%)
4/5/2011 - 4/11/2011



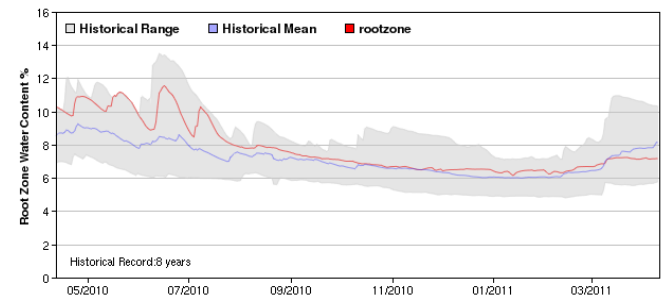
Percent of Max Available Water 100cm (%)
4/5/2011 - 4/11/2011



Generated 4/12/2011

High Plains Regional Climate Center

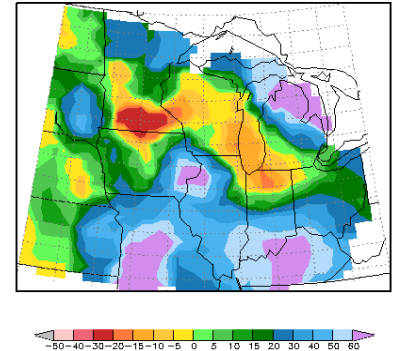
SIDNEY Root Zone Soil Moisture valid 4/12/2010 - 4/11/2011



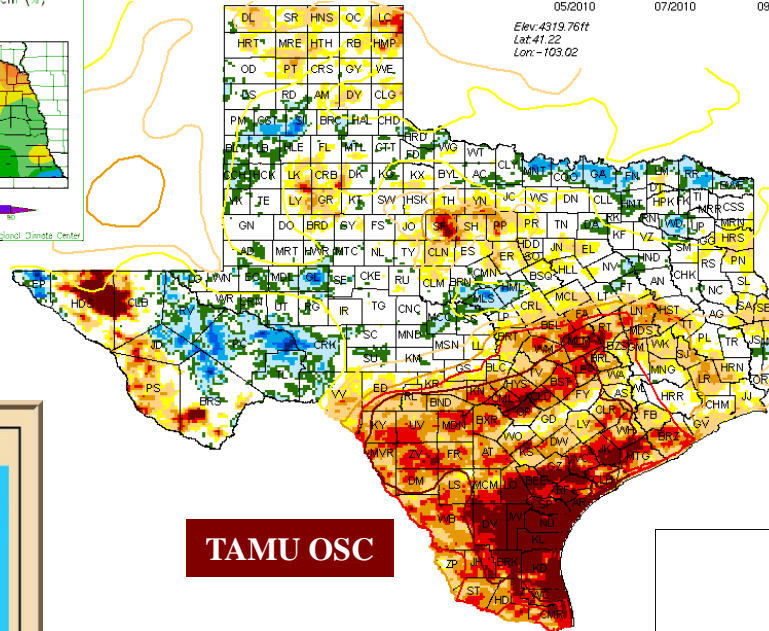
Elev: 4319.76ft
Lat: 41.22
Lon: -103.02

"Experimental" May Contain Preliminary Data
High Plains Regional Climate Center
<http://hprcc.unl.edu>

Current Soil Moisture Depth (cm), Depth = 0-12
July-26-2009

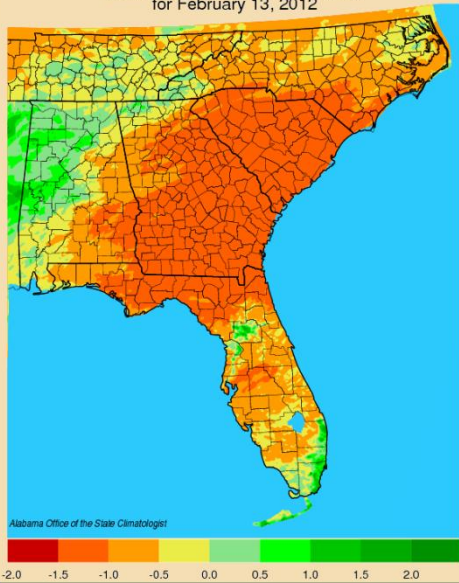


Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois

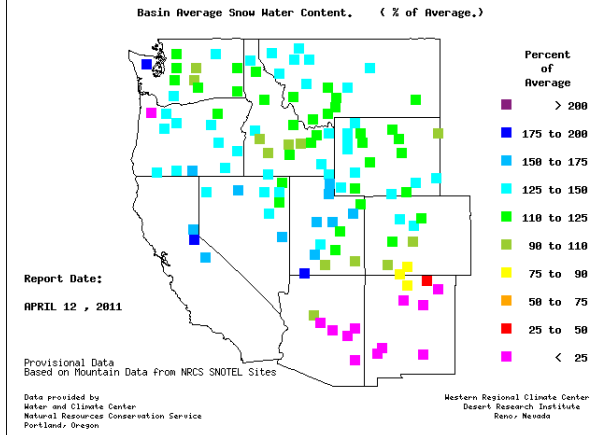


TAMU OSC

Lawn-and-Garden Moisture Index
for February 13, 2012



Alabama Office of the State Climatologist



Report Date:
APRIL 12, 2011

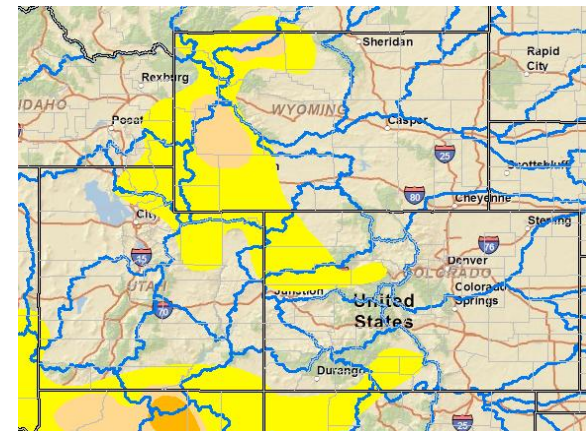
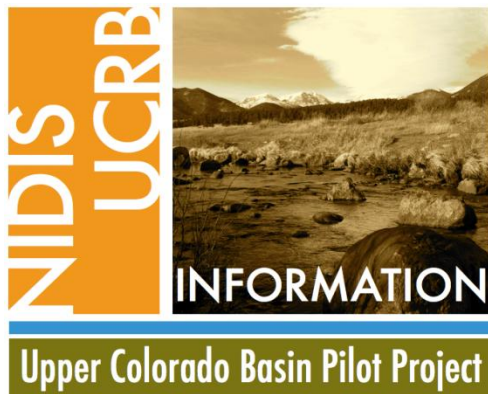
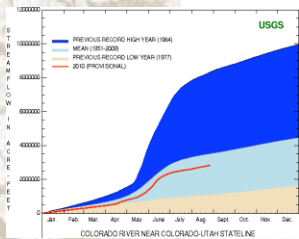
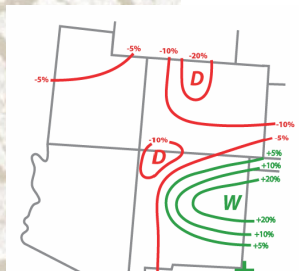
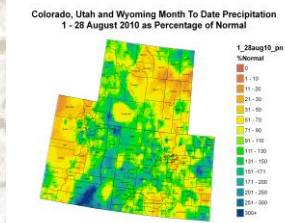
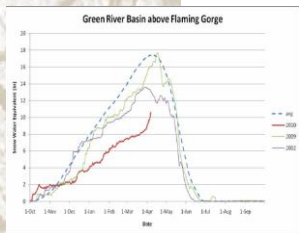
Provisional Data
Based on Mountain Data from NRCS SNOTEL Sites

Data provided by:
Water and Climate Center
Natural Resources Conservation Service
Portland, Oregon

Western Regional Climate Center
Desert Research Institute
Reno, Nevada

UCRB Weekly Drought Assessment

<http://www.drought.gov/portal/server.pt/community/ucrb>

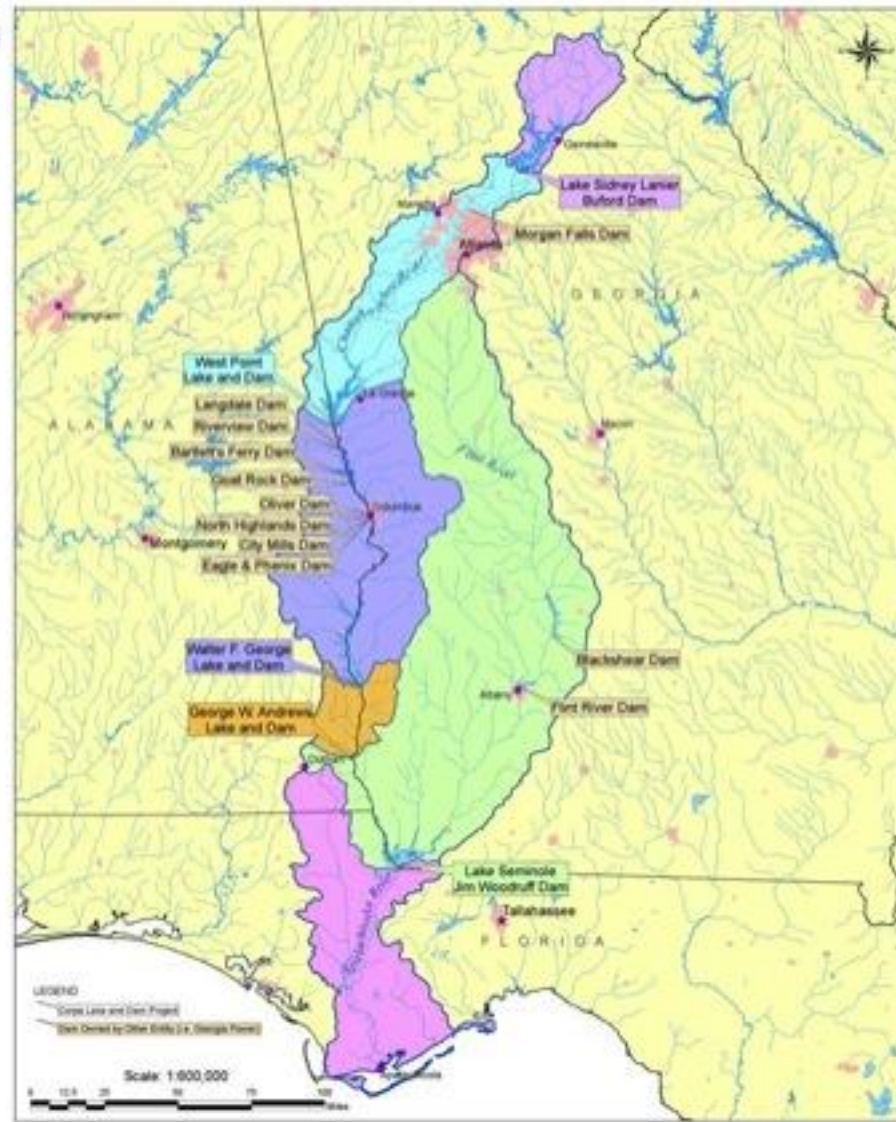
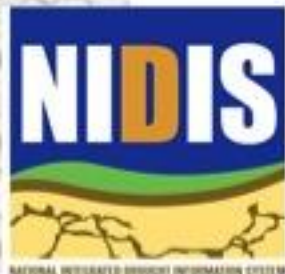


**Consensus recommendation
to USDM author**

National Integrated Drought Information System

Southeast US Pilot for Apalachicola- Flint- Chattahoochee River Basin

22 March 2011

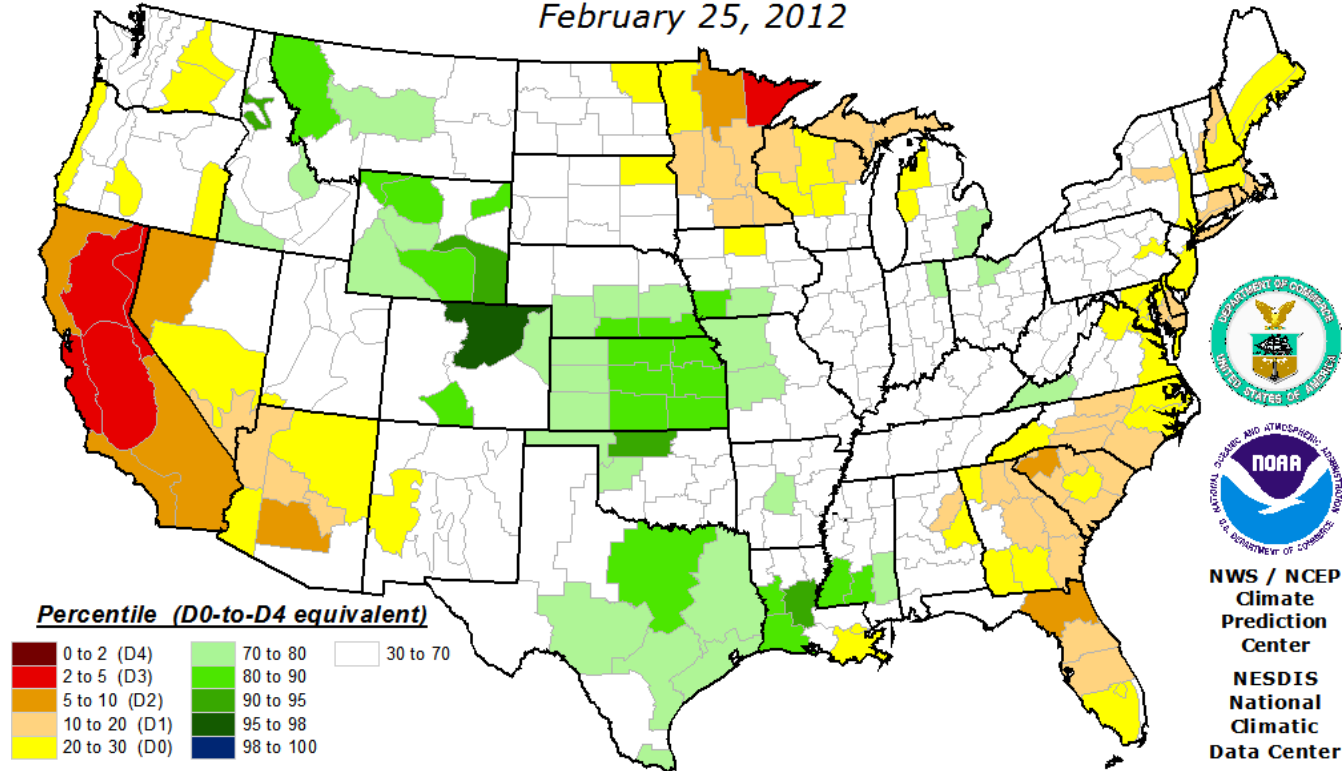


Objective Blends

➤ Short-Term Blend

35% Palmer Z Index
25% 3-Month Precip.
20% 1-Month Precip.
13% CPC Soil Model
7% Palmer Drought Index

Objective Short-Term Drought Indicator Blend Percentiles February 25, 2012



This map approximates impacts that respond to precipitation over several days to a few months, such as agriculture, topsoil moisture, unregulated streamflows, and most aspects of wildfire danger. The relationship between indicators and impacts can vary significantly with location and season. Do not interpret this map too literally.

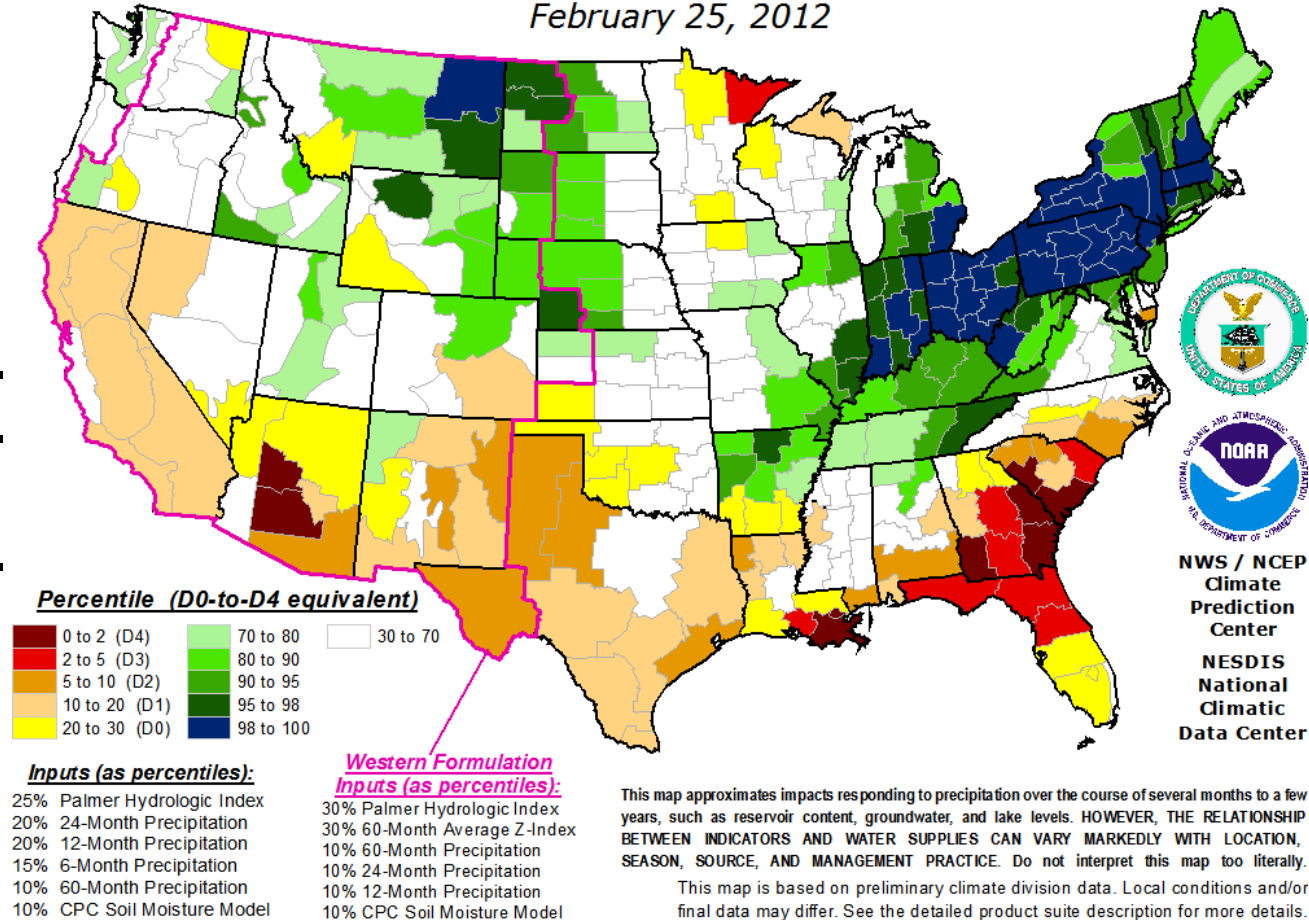
This map is based on preliminary climate division data. Local conditions and/or final data may differ. See the detailed product suite description for more details.

Objective Blends

➤ Long-Term Blend

25% Palmer
 Hydrological Index
 20% 24-Month Precip.
 20% 12-Month Precip.
 15% 6-Month Precip.
 10% 60-Month Precip.
 10% CPC Soil Model

Objective Long-Term Drought Indicator Blend Percentiles
February 25, 2012



DROUGHT INDICATOR BLEND AND COMPONENT PERCENTILES -- September 10, 2011

(KEY: D4=0-2 [pink fill] D3=2-5 [red fill] D2=5-10 [brown fill] D1=10-20 [tan fill] D0=20-30 [yellow fill] WET=70-100 [green text])

Climate Division						Drought Blends		Individual Blend Components											
								Precipitation						Palmer Z-Index	Palmer Drought Index (PDI)	Palmer Hydro. Drought Index (PHDI)	5-Year Average Z-Index	CPC Soil Moisture Model	
ID #	U.S. CD #	State #	State CD #	State Name	CD Name	Short Term	Long Term	1-Month	3-Month	6-Month	1-Year	2-Year	5-Year						
0101	1	1	1	Alabama	Northern Valley	94.6	82.4	99.5	89.3	93.4	77.5	76.7	31.9	89.9	77.3	73.0	26.1	98.8	
0102	2	1	2	Alabama	Appalachian Mountain	97.8	88.8	99.5	92.3	95.4	71.6	80.5	37.1	98.4	93.5	92.0	17.4	100.0	
0103	3	1	3	Alabama	Upper Plains	77.6	54.6	86.3	56.4	60.6	40.7	74.4	54.7	75.7	54.5	27.6	30.4	88.8	
0104	4	1	4	Alabama	Eastern Valley	57.9	25.7	72.9	50.5	38.9	20.6	64.0	20.5	61.7	42.2	13.6	3.6	26.3	
0105	5	1	5	Alabama	Piedmont Plateau	9.1	11.4	19.2	15.2	7.0	4.3	52.7	21.2	14.3	12.1	7.9	15.9	7.5	
0106	6	1	6	Alabama	Prairie	54.3	13.2	70.1	49.3	15.9	9.5	38.2	21.5	62.0	40.3	16.0	20.2	18.8	
0107	7	1	7	Alabama	Coastal Plain	19.8	8.2	25.5	26.2	4.6	3.7	35.6	41.3	29.3	4.5	3.2	28.0	12.5	
0108	8	1	8	Alabama	Gulf	78.8	19.2	81.5	63.8	10.9	5.1	46.1	43.0	90.4	44.3	19.7	41.8	56.3	
0201	9	2	1	Arizona	Northwest	17.1	26.9	16.6	41.7	17.6	49.0	43.3	5.0	10.3	37.9	46.2	15.3	25.0	
0202	10	2	2	Arizona	Northeast	28.9	17.6	29.1	53.2	21.7	21.0	49.3	34.5	23.9	16.9	20.2	17.5	21.3	
0203	11	2	3	Arizona	North-Central	3.6	0.7	4.0	23.0	2.1	10.2	13.5	1.7	1.3	9.4	9.5	0.5	2.5	
0204	12	2	4	Arizona	East-Central	35.2	14.6	17.2	72.1	25.8	17.4	52.9	43.7	38.2	10.3	11.6	22.1	16.3	
0205	13	2	5	Arizona	Southwest	55.7	54.7	34.5	91.5	67.2	43.9	68.0	37.9	30.3	65.6	70.5	37.5	53.8	
0206	14	2	6	Arizona	South-Central	9.3	1.4	8.9	29.8	9.9	3.7	16.2	9.0	12.7	6.2	8.3	2.3	2.5	
0207	15	2	7	Arizona	Southeast	42.5	8.5	47.2	88.2	62.5	7.0	24.4	18.9	8.3	3.8	3.2	9.0	62.5	
0301	16	3	1	Arkansas	Northwest	11.7	59.6	50.4	4.5	92.2	76.2	78.0	95.0	7.2	5.5	6.2	89.9	25.0	
0302	17	3	2	Arkansas	North-Central	15.5	64.8	35.1	6.4	93.9	70.4	94.9	100.0	18.8	10.6	10.6	100.0	32.5	
0303	18	3	3	Arkansas	Northeast	10.2	54.9	16.1	7.3	85.9	53.0	77.5	94.8	12.1	6.2	7.6	82.3	31.3	
0304	19	3	4	Arkansas	West-Central	12.5	38.4	47.9	4.2	70.5	29.3	57.8	98.8	10.7	8.1	7.1	92.7	17.5	
0305	20	3	5	Arkansas	Central	33.4	55.2	71.5	22.9	79.7	38.6	76.0	100.0	22.8	21.6	14.0	94.3	52.5	
0306	21	3	6	Arkansas	East-Central	39.8	54.8	62.4	27.0	82.4	51.1	67.8	75.5	35.7	19.9	18.9	53.9	55.0	
0307	22	3	7	Arkansas	Southwest	2.1	14.7	11.5	1.0	27.4	6.7	39.6	64.4	4.7	0.0	0.0	45.4	5.0	
0308	23	3	8	Arkansas	South-Central	23.4	15.8	55.6	14.9	25.5	2.3	38.2	75.0	26.8	2.3	2.3	68.4	17.5	
0309	24	3	9	Arkansas	Southeast	22.5	8.2	51.3	29.7	13.4	0.9	25.0	48.5	17.1	0.0	0.0	34.3	21.3	
0401	25	4	1	California	North Coast Basin	36.9	38.7	8.1	37.2	49.8	60.0	64.7	21.6	40.7	42.0	46.8	19.1	81.3	
0402	26	4	2	California	Sacramento Basin	53.3	65.4	21.5	55.6	66.1	81.3	78.3	28.0	48.0	61.3	70.0	33.7	96.3	
0403	27	4	3	California	Northeast Interior Basin	34.7	53.7	5.0	63.7	73.9	85.9	78.3	24.7	17.5	32.8	58.1	23.7	85.0	
0404	28	4	4	California	Central Coast Basin	66.1	61.0	72.4	93.1	61.6	80.5	85.2	46.8	26.6	23.7	49.6	42.8	91.3	
0405	29	4	5	California	San Joaquin Basin	85.7	71.3	100.0	99.5	73.9	94.0	92.0	41.9	56.9	48.6	62.4	39.0	98.8	
0406	30	4	6	California	South Coast Basin	40.5	35.1	39.3	29.7	31.2	81.9	79.7	21.0	42.1	34.4	34.4	8.7	73.8	
0407	31	4	7	California	Southeast Desert Basins	56.2	35.6	35.4	70.8	22.5	62.4	49.3	5.5	51.1	46.4	53.3	10.8	58.8	
Climate Division						Drought Blends		Individual Blend Components											
								Precipitation						Palmer Z-Index	Palmer Drought Index (PDI)	Palmer Hydro. Drought Index (PHDI)	5-Year Average Z-Index	CPC Soil Moisture Model	
ID #	U.S. CD #	State #	State CD #	State Name	CD Name	Short Term	Long Term	1-Month	3-Month	6-Month	1-Year	2-Year	5-Year						
0501	32	5	1	Colorado	Arkansas Basin	4.1	8.7	16.0	13.1	11.2	0.5	23.8	38.8	4.1	0.0	0.0	23.3	3.8	
0502	33	5	2	Colorado	Colorado Basin	49.6	66.6	46.9	67.8	82.8	76.0	65.4	76.5	29.6	52.2	56.8	51.9	70.0	
0503	34	5	3	Colorado	Kansas Basin	9.5	54.7	7.8	18.6	72.5	46.2	67.7	93.5	5.8	28.7	29.4	73.5	41.3	

Some Examples of Decision Making Using the DM

- ***Policy***: 2008 Farm Bill/IRS/USDA/NOAA DGT/State drought plan triggers (several)
- ~3.5M+ page views and ~2M+ visitors/year
- ***Media***: The Weather Channel/USA Today and all major newspapers/Internet Media/ Network News/ CNN/NPR/etc.
- Presidential/Congressional briefings
- NIDIS portal/portlet
- A model of interagency/level collaboration

Some Examples of Decision Making Using the DM

- **USDA Dried Milk Program**
- **USDA CRP Release hot spot trigger**
- **Numerous states use as a drought trigger (Governor's declarations)**
- **USDA Livestock Assistance**
- **IRS (tax deferral on livestock losses)**
- **NWS Drought Information Statements (DGTs) when CWA is in D2 or worse**

Next Steps

- **Revisit and refresh** the *DM Classification Table*
- **IMPACTS**: We have changed the (A)gricultural and (H)ydrological impact labels to (S)hort and (L)ong-term drought
- **Gridded OBDI blends**
- Continue to **evaluate and integrate** new tools (ET-ALEXI/GRACE/NLDAS/SM/GW...)
- Continue to work w/ states and basins on a **coordinated DEWS**:
 - **NIDIS**: UCRB/ACF/4-Corners/CA
 - HI, NC, TX, FL, AL, AZ.....**Who's Next?!?!**
- Continue to **listen to your needs** and do what we can....it is a **“living”** product

Thank You

Please contact me at:

**Mark Svoboda
National Drought Mitigation Center
402-472-8238
msvoboda2@unl.edu**

The U.S. Drought Monitor – Local Input

John W. Nielsen-Gammon
Texas State Climatologist
Texas A&M University

Local Input

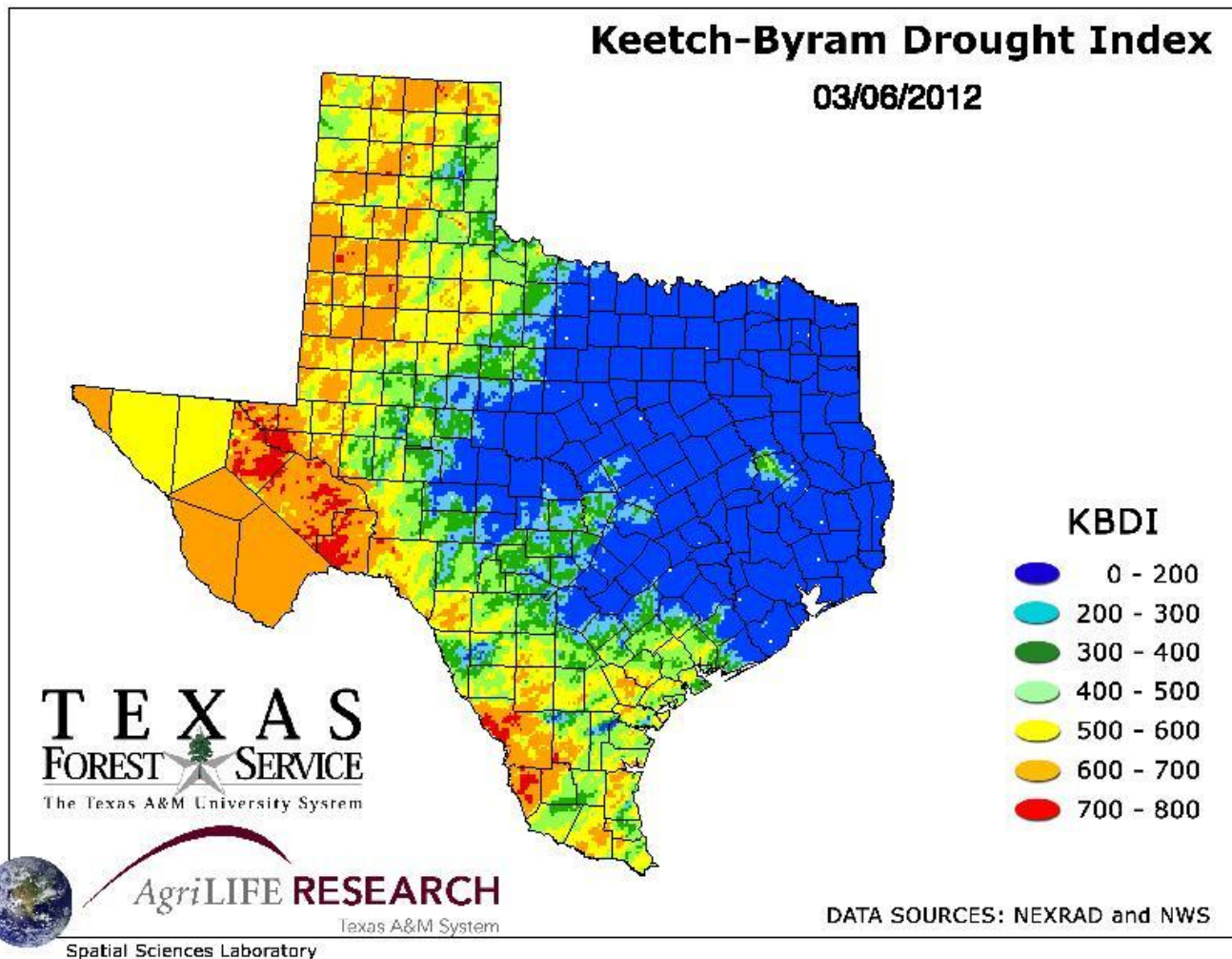
Levels of input

- State coordination
- Individual input
- Rumors and impacts

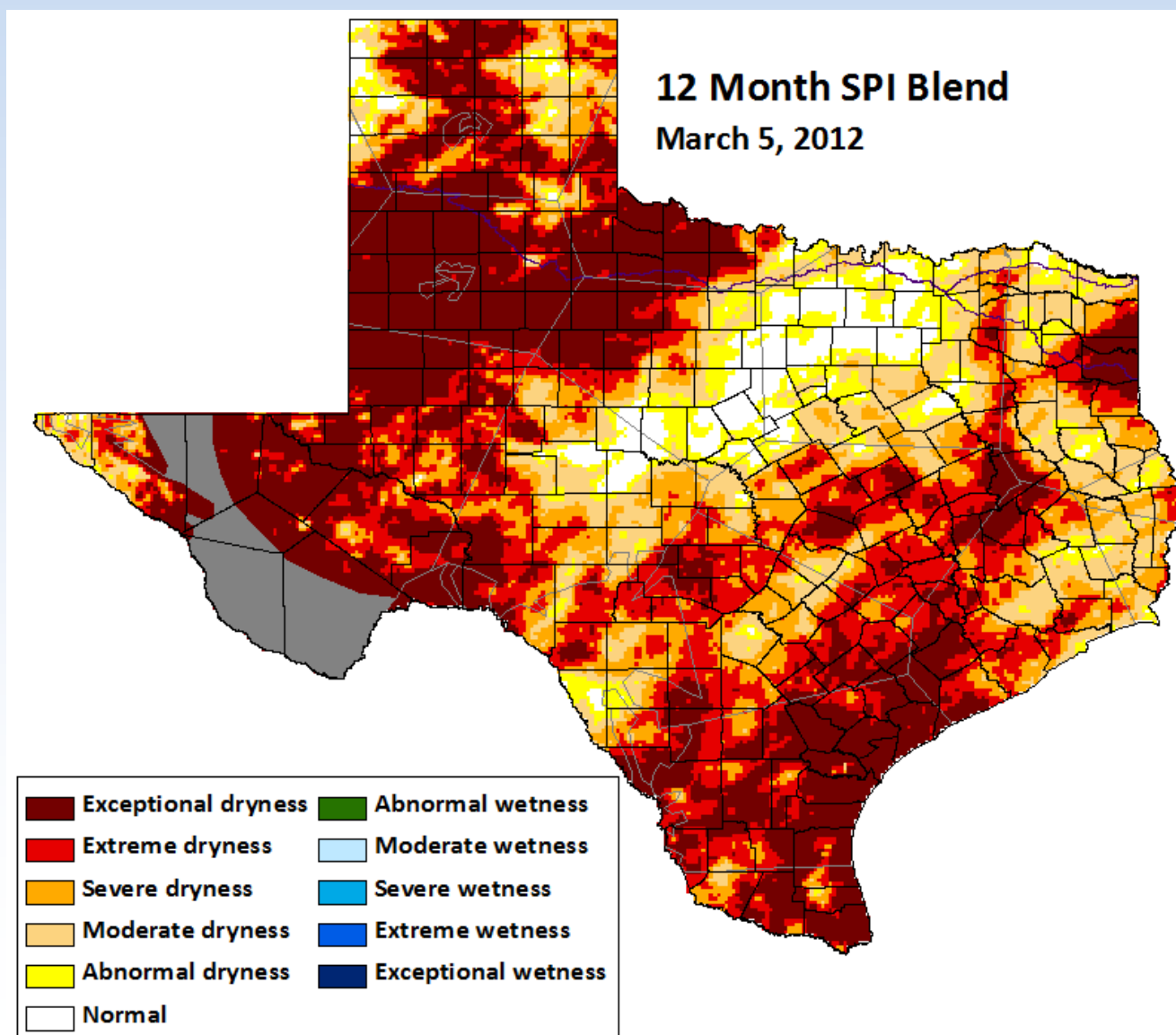
Purposes of input

- Fine-scale information
- Interpretation of drought indicators
- Relationship between indicators and impacts
 - When is agricultural drought possible?
 - When is flash drought possible?

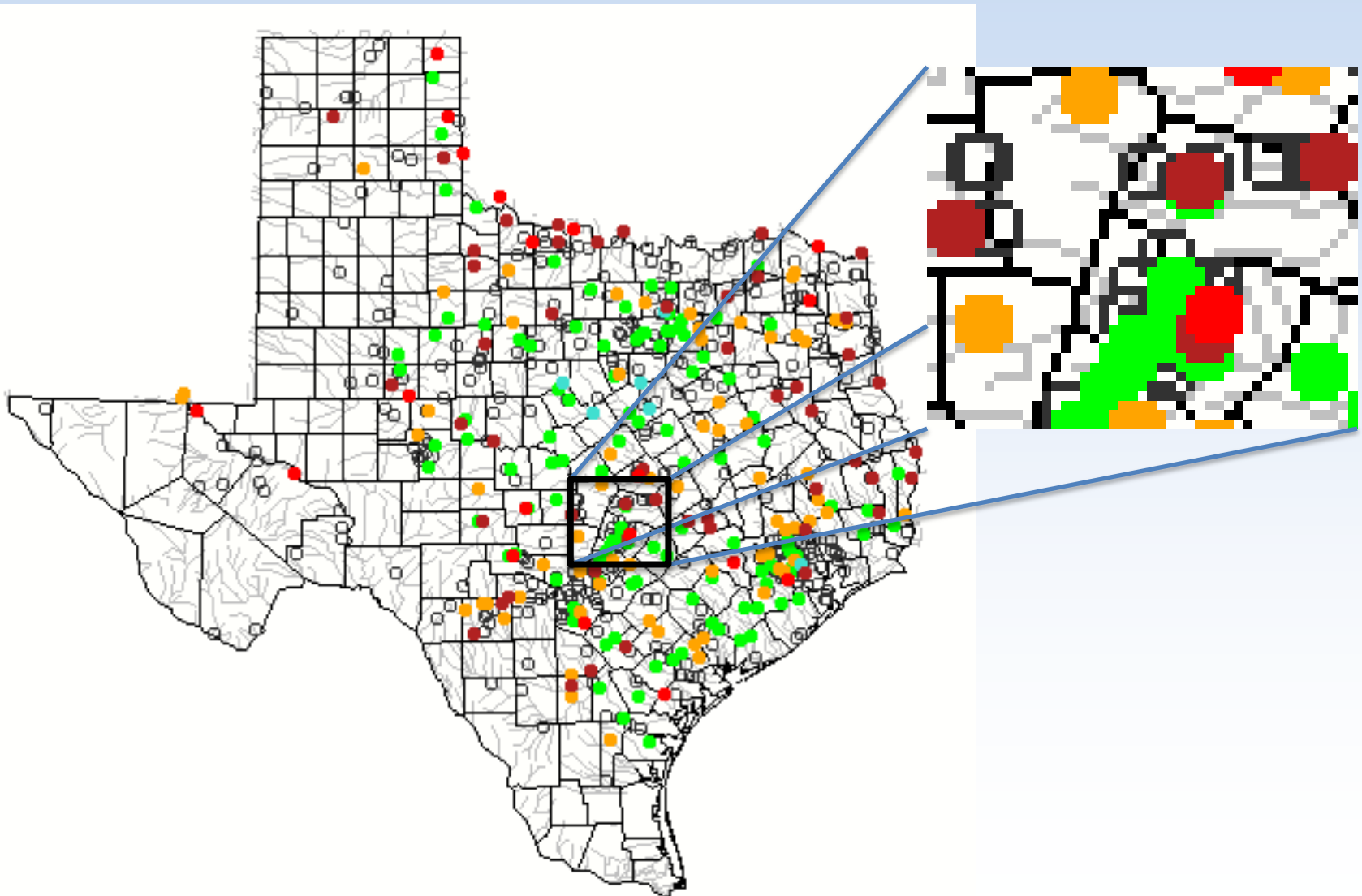
Keetch-Byram Drought Index: Texas Forest Service/Texas AgriLife



Hi-Res SPI Blends: OSC



USGS Streamflow



Local Impacts

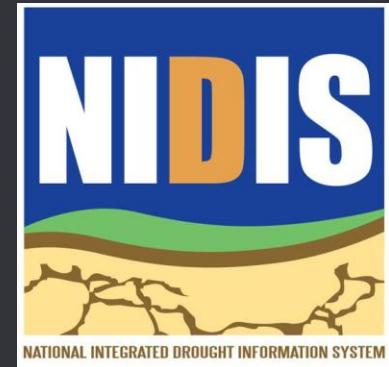
- Winter wheat
 - Critical periods for rainfall
 - Status of crop
 - Impacts of other weather events

Challenges with Local Info

- Translating to DM levels
- Obtaining documentation
- Balancing opposing viewpoints
- Lack of DM understanding
 - “The Drought Monitor must just be depicting agricultural drought because it showed improvement as soon as it started raining.”
 - “The Pedernales River is still bone-dry.”

“Everybody complains about the Drought Monitor, but nobody ever does anything about it.”

- Mark “Twain” Svoboda



National Integrated Drought Information System (NIDIS)

March 8, 2012

Chad McNutt

NOAA, Earth System Research Laboratory/Climate Program Office

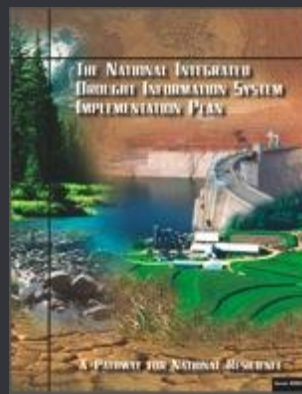
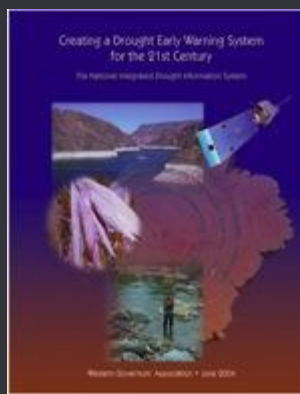
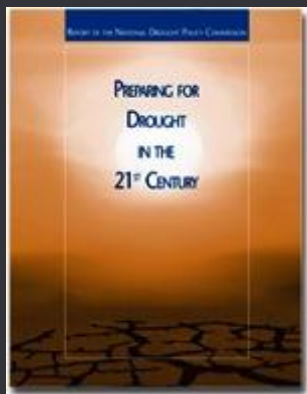
NIDIS: Creating a drought early warning information system

- Public Law 109-430 (The NIDIS Act 2006)

- “Enable the Nation to move from a reactive to a more proactive approach to managing drought risks and impacts”
- “better informed and more timely drought-related decisions leading to reduced impacts and costs”

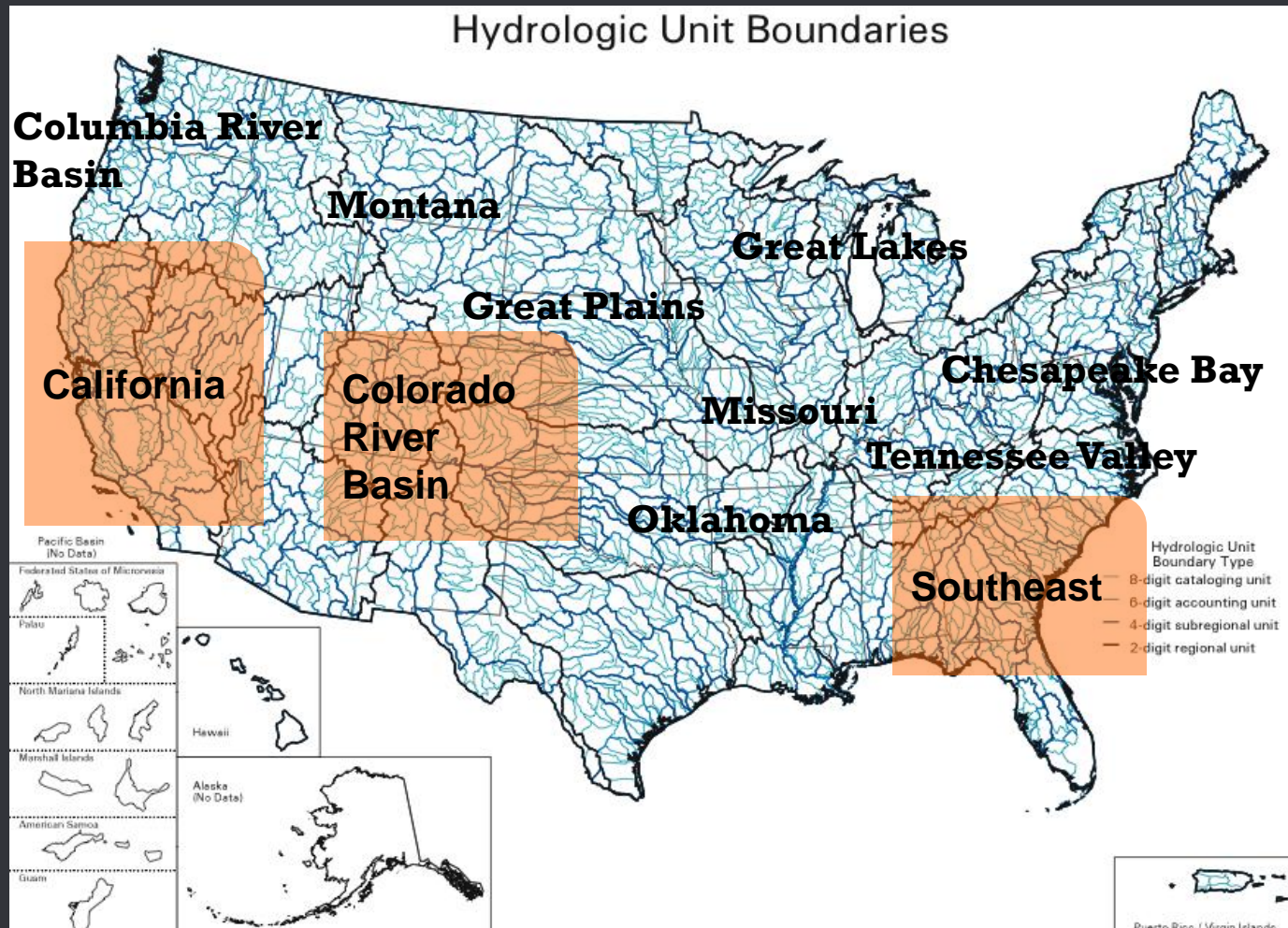
- NIDIS Objectives

- Coordinating national drought monitoring and forecasting systems
- Providing an interactive drought information clearinghouse and delivery system for products and services—including an internet portal and standardized products (databases, forecasts, Geographic Information Systems (GIS), maps, etc)
- Designing mechanisms for improving and incorporating information to support coordinated preparedness and planning

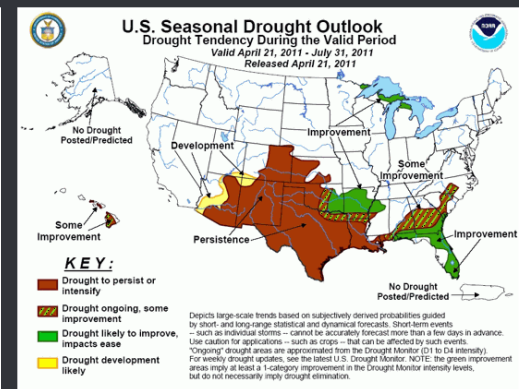
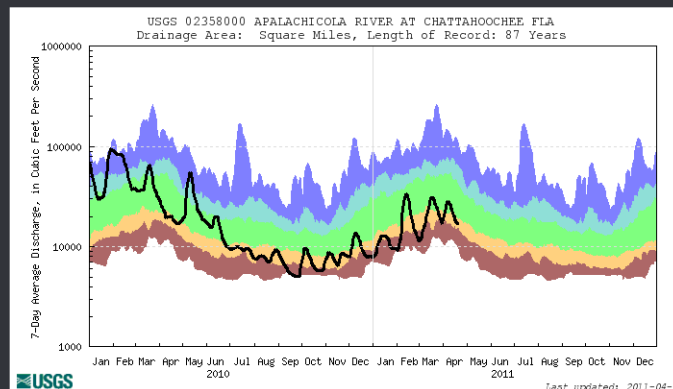
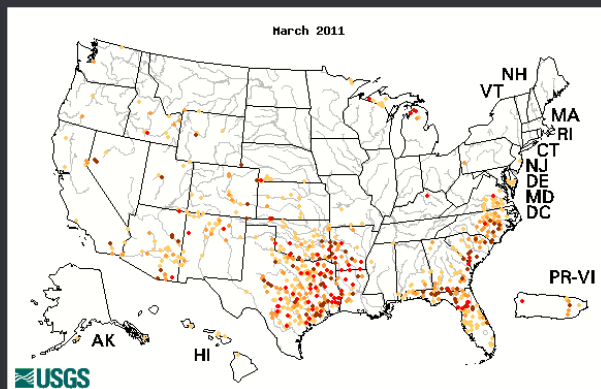
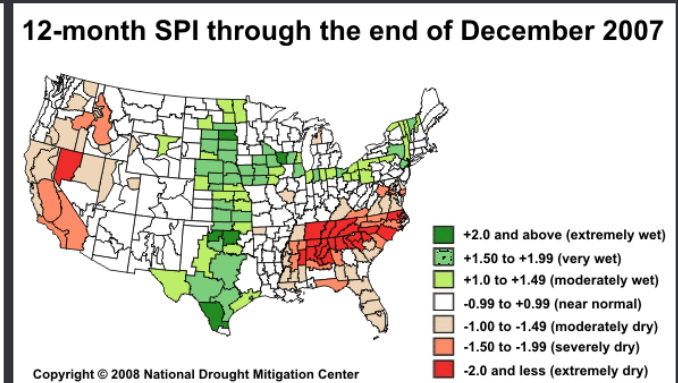
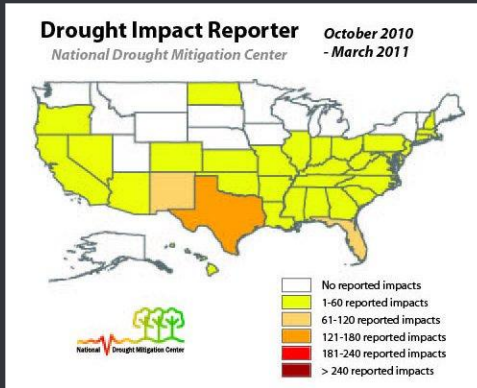
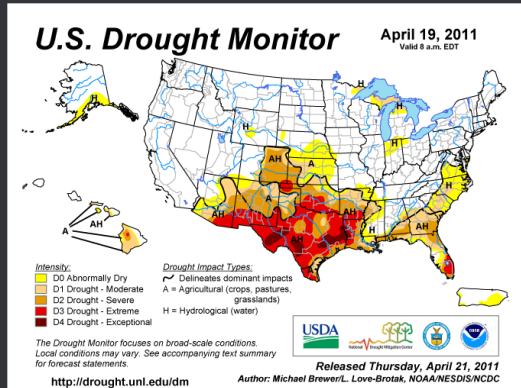


NIDIS Early Warning Systems Pilots

Highlighted-first round prototypes;
Others-Regional DEWS & transferability



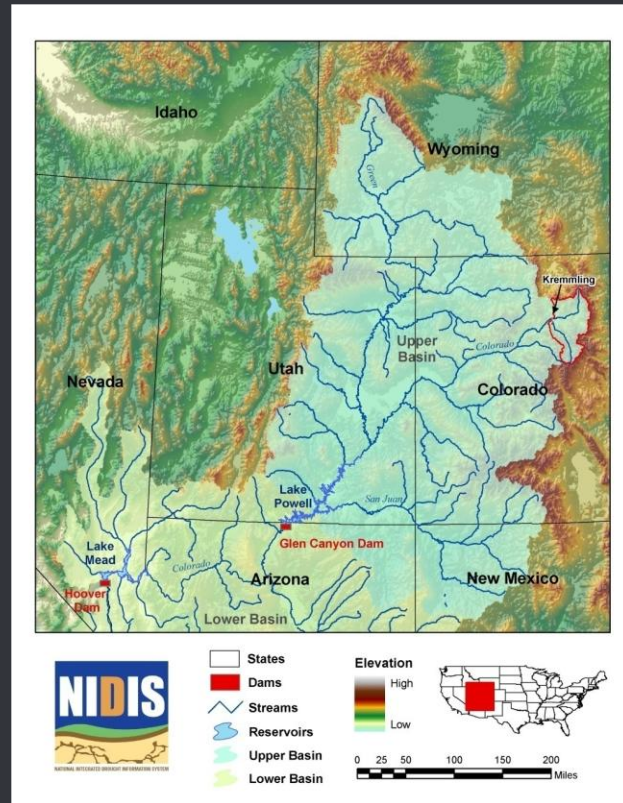
We have the tools to assess current conditions and to provide short-term and seasonal forecasts...but how do we communicate potential problems associated with drought? How do agencies and citizens work together to mitigate the negative impacts of drought?



Developing Drought Early Warning in Upper Colorado River Basin

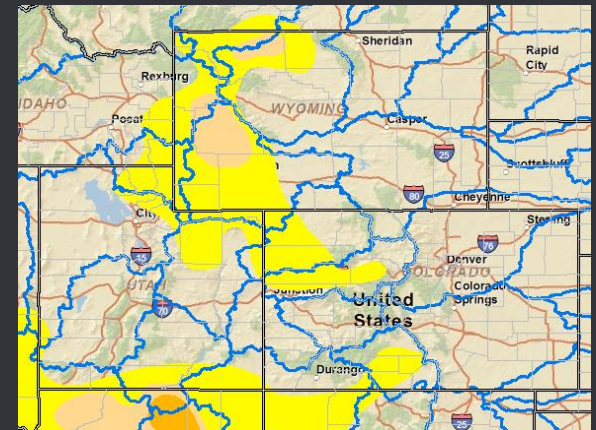
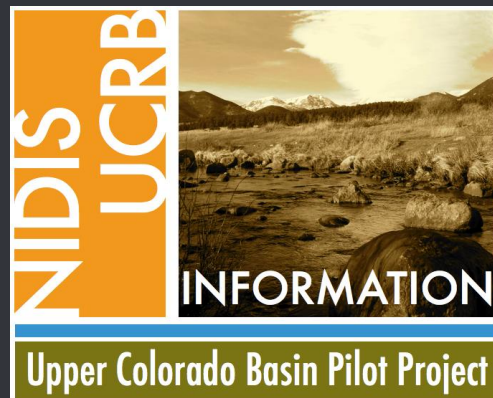
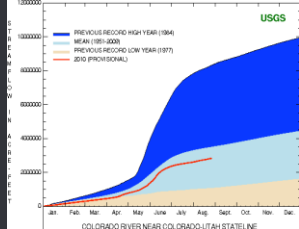
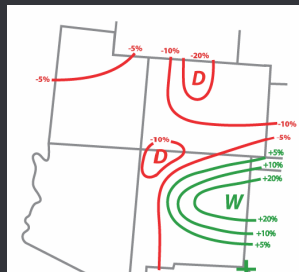
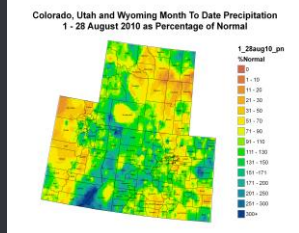
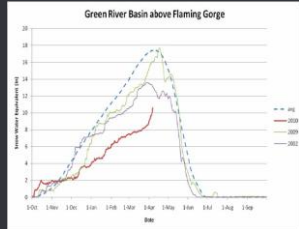
Specific questions UCRB is addressing:

- Drought monitoring practices: Indicators & Triggers for decision makers
- Gaps in our understanding of drought: Are we making good use of what measurements we already have
- Gaps in current observational networks (e.g., stream gaging, wx obs, SNOTEL, soil moisture, reservoir levels): What is the status of these networks, What are the measurement gaps
- Gaps in analytical products and tools: e.g. “Where does the snow go?” Evapotranspiration, sublimation & soil moisture products
- Gaps in knowledge of water use: Water demand and use



UCRB Weekly Drought Assessment

<http://www.drought.gov/portal/server.pt/community/ucrb>



**Consensus recommendation
to USDM author**

Developing Drought Early Warning in the ACF

ACF Activities

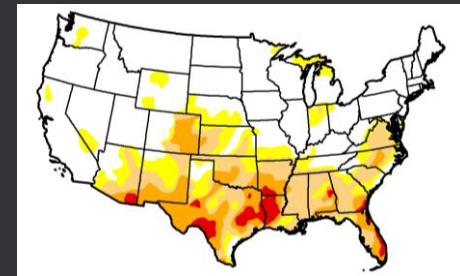
- Better Monitoring and Forecasting
- Synthesis/analysis of data used to “trigger” set actions within a drought plan
- Develop municipal supply drought index tool for water providers
- Efficient dissemination/communication of information, e.g. drought assessment webinars and outlook forum
- Integrating information into drought risk planning
- Increased Education and Awareness: ACF Water Newsletter and FAQ Sheets



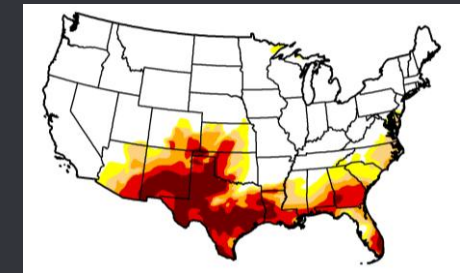
Southern Plains and Drought Early Warning

Responding to the Southern Plains Drought

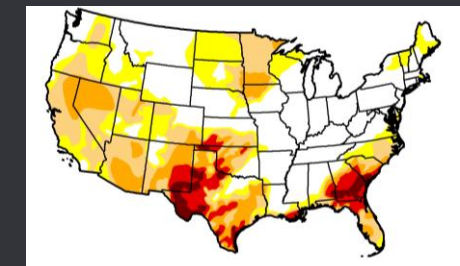
- State Drought Planning Workshop (lead by SCIPP)
- Drought Outlook Forums
 - Austin (June) & Fort Worth (November)
- Managing Drought Webinars
- Sustain information and processes that will reduce or mitigate impacts for the next drought



March 8, 2011



June 7, 2011



February 28, 2012

NIDIS Next Steps

- ◉ Southern Plains drought assessment
 - Evolution of the drought and its impacts
- ◉ Develop other areas: NIDIS Pilot in California, MO. Basin, Carolinas, & Chesapeake Bay
- ◉ Sustain the outlook and drought assessment efforts
- ◉ Drought Coordinator Network

Thanks

Chad McNutt
chad.mcnutt@noaa.gov

Resources

- U.S. Drought Portal
 - <http://www.drought.gov>
- Southern Plains Information & Past Webinars
 - http://www.drought.gov/portal/server.pt/community/southern_plains
- Drought Impact Reporter
 - <http://droughtreporter.unl.edu/>
- State Climatologists
 - <http://www.stateclimate.org/>
- National Drought Mitigation Center
 - <http://drought.unl.edu/>
- Southern Climate Impacts Planning Program (SCIPP)
 - <http://www.southernclimate.org/>
 - Youtube: <http://www.youtube.com/user/SCIPP01>
- Climate Assessment for the Southwest (CLIMAS)
 - <http://www.climas.arizona.edu/>



We are now on facebook!
Southern Climate Impacts Planning Program

Is drought properly classified in your region? If not, let us know!

- Drought Impact Reporter
- Contact your State Climatologist
- E-mail the DM Authors:
droughtmonitor@unl.edu